

# UNIVERSAL TOOLING AND GAGING PRODUCTS



**RECOGNIZED AROUND THE WORLD FOR  
PROVIDING SUPERIOR QUALITY AND SERVICE  
ISO 9001/2008 ACCREDITED**



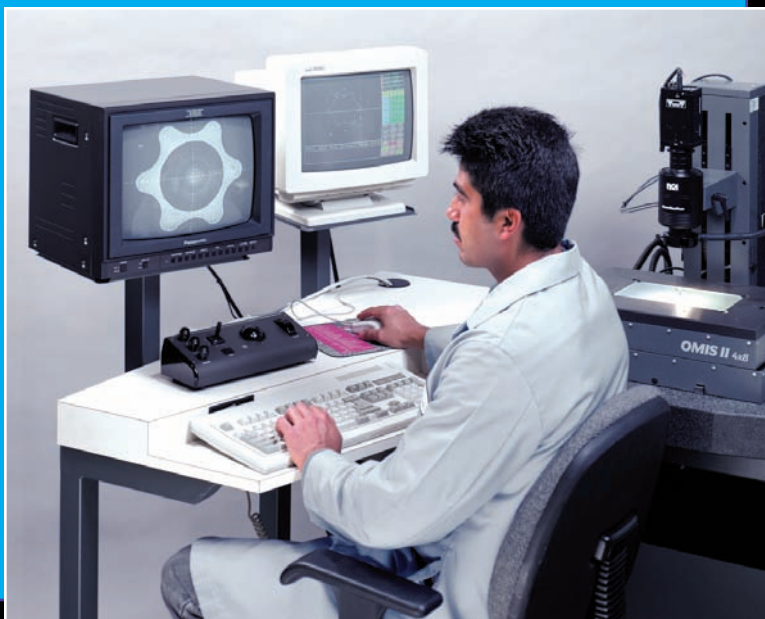




**MODERN VACUUM HEAT TREATING FACILITY**

Universal Punch Corp. is a high precision tool and gage manufacturer using high tech applications to make a wide range of products to meet today's increased demands for superior performing tools and high precision gaging.

With 35 years of experience Universal Punch Corp. is known for maximum quality and dependability. Our modern vacuum heat treating facility provides the control necessary to make tools with the highest structural integrity and tools that will withstand the severest heading application. In addition, complete inventories of standard tooling are available for immediate delivery in a variety of materials, finishes and coatings.



**GAGE CALIBRATION**



**HARDNESS INSPECTION**

# INTRODUCTION

**MISSION STATEMENT:** To be a world class contract supplier of tools and gauges to the Aerospace, Automotive, Appliance, Defense, Electronic, Machine Tool, Medical Devices, Munition and other industries with innovative designs and always attentive to the needs of our customers.

**COMPANY:** Universal Punch Corp. is an ISO 9001:2008 registered company, has been a leader in the tooling and gauging industry for nearly four decades. As part of our continuing commitment to providing precision and excellence in all of our products we have expanded into a state of the art 65,000 sq. ft. facility. Our spacious new plant is equipped with increased machining capacity, expanded heat treating department, calibration and inspection laboratory. Our laboratory ensures that all products sold conform to ISO 17025 standards. All measuring equipment and gauging masters are directly traceable to N.I.S.T.

**SERVICES:** Universal Punch Corp. is a high precision tool and gauge manufacturer using high tech applications to make a wide range of products to meet today's increased demands for superior performing tools and high precision gaging. Our modern vacuum heat treating facility provides the control necessary to make tools with highest structural integrity, which will withstand the severest heading application of warm or cold forming. In addition, complete inventories of standard tooling are available for immediate delivery in a variety of materials, finishes and coatings.

**TOOLING:** popular drive systems with worldwide inventories, such as Phillips, P-Z Drive, Type 1A, SupaDrive, Six & Eight-Point Drives, Twelve-Point, ISO Hexalobular, Six-Lobe, Allen Hexagon, Double Hexes, Penta Drive, Square Drive, Indented Hexagon, Combinations, Spline Drive, Tamper Proof, NAS Cruciform, Star type forms and custom forms.

**GAGING:** Go/No-Go, Penetration, Final Inspection, Plug Gages, Concentricity Gages, Thickness, Driver Bit, Recess, Wobble, Screw Recess, Screw Testing Fixtures, Runout, Protrusion Height, Variable Reading Thread Gages, Special Modular Gaging Fixtures, SPC Data Collection Systems and Gage Calibration Service.

**SPECIALTIES:** We have full time engineering staff using AutoCAD and SolidWorks CAD/CAM software for drawing and CNC machine programming. Our manufacturing processes consist of a large number of special five and six axis CNC Form Grinders, CNC Mill/Turning Lathes, Mills, Swiss Screw Machines, Wire EDM and conventional EDM to ensure quality and reliability of products. We have a full in-house lab, temperature and humidity controlled for customer calibration of gauges, SIP 305 and Video Microscope.

**INTERNATIONAL SERVICES:** Universal Punch Corp. is dedicated to the global marketplace. Agents or distributors located in United States, Mexico, North America, Canada, South America, England, France, Spain, Germany, Italy, Switzerland, Turkey, India, South Korea, Singapore, China, Taiwan, Japan and Australia are ready to assist you.

**ACHIEVEMENTS:** ISO 9001/2008 by Underwriters Laboratories Inc. with quality emphasis on compliance to ISO Guide 25, the development of the two-piece hex punch system and later the 6-Lobe/Hexalobular system, special Medical Driver Systems, along with the patented Concentricity Gauge and various fastener gauges are just some of our achievements.

**WEBSITES:** [www.universalpunch.com](http://www.universalpunch.com) ; [www.concentricitygage.com](http://www.concentricitygage.com) ; [www.six-lobe.com](http://www.six-lobe.com) ; [www.wobble-broaches.com](http://www.wobble-broaches.com)

**EMAIL:** [sales@universalpunch.com](mailto:sales@universalpunch.com)

**PHONE:** 714-556-4488

**FAX:** 714-556-6314

Servicing your tooling and gaging requirements into the twenty first century.

Regards,

*Kenneth L. Williams Sr.*

President



# CERTIFICATE



**UL DQS Inc.**  
Management Systems Solutions

hereby certifies that the company

## **UNIVERSAL PUNCH CORP.**

4001 W. MacArthur Blvd.  
Santa Ana, CA 92704 USA

has implemented and maintains a **Quality Management System.**

**Scope:**

The design and manufacture of tooling and gages for the fastener, medical and other industries.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

## **ISO 9001 : 2008**

Certificate registration no. 10002448 QM08

Date of certification 2009-09-08

Valid until 2012-09-07

Ganesh Rao  
President





# TERMS AND CONDITIONS

**TERMS:** Net 30 Days, F.O.B. saNta aNa, CaliFOrNia. all priCes suBJeCt tO ChaNge withOut NOtiCe.

**DELIVERY:** is always quOteD aFter reCeipt OF OrDer. stOCK OrDers will prOCess iN 3 BusiNess Days unless speCiFieD Next Day rush serviCe.

**ORDERING & BILLING:**

MiNiMuM BilliNg - \$100.00

MiNiMuM OrDer FrOM stOCK - \$100.00

MiNiMuM MaNuFaCtureD OrDer - \$200.00

**SHIPPING:** unless Otherwise iNstruCteD shippiNg will Be DONE By the least expeNsive way. we CaNNOt assuMe Charges Or respONsibility Due tO traNspOrtatiON DiFFiCulties. Due tO the Nature OF Our BusiNess, we reserve the right tO ship aND Charge the CustOMer FOr 10% Over Or uNDeR speCiFieD quaNtities.

**QUOTATIONS:** are valiD FOr 30 Days ONLY, unless speCial arraNgeMeNts are MaDe. we reserve the right tO aDvise the CustOMer OF aNy ChaNge iN priCe upON reCeipt OF OrDer, iF yOu have BeeN quOteD iNCOrrEctly.

**CANCELLATIONS:** will Be suBJeCt tO a MiNiMuM Charge OF \$75.00 plus aNy appliCaBle Material aND laBOR Charges FOr wOrk iN prOGress.

**RETURNS:** pOsitively NO tOOls Or gages May Be returNeD withOut FaCtOry authOrizatiON aND requests FOr suCh Must Be MaDe withiN 14 Days OF reCeipt OF MerChaNDise. tOOliNg aCCepteD uNDeR these CONDitiONS shall Be suBJeCt tO the right OF repair Or replaCeMeNt.

**RETURNS:** all returNeD stOCK iteMs will Be suBJeCt tO a 20% restOCKiNg Charge.

**EXCLUSIONS AND LIMITATIONS:** DUE TO THE SEVERITY OF ALL MANUFACTURING PROCESSES AND THE COMPLEXITY OF CONDITIONS SURROUNDING TOOL USAGE, IT IS A FIRM POLICY OF THIS COMPANY NOT TO GUARANTEE TOOL PERFORMANCE, BUT ONLY CONFORMANCE TO PHYSICAL SPECIFICATIONS AND WORKMANSHIP. THIS LIMITED WARRANTY APPLIES ONLY TO GAGES AND GAGE PARTS MANUFACTURED BY OR FOR UNIVERSAL PUNCH CORP.: THAT WITHIN (12) MONTHS FROM DATE OF SHIPMENT, WE WILL REPAIR OR REPLACE, AT OUR OPTION, FREE OF CHARGE, ANY PART OR PARTS WHICH UPON EXAMINATION WE FIND DEFECTIVE IN WORKMANSHIP OR MATERIAL. THE LIMITED WARRANTY DOES NOT APPLY TO ANY GAGES OR GAGE PARTS THAT HAVE BEEN DISASSEMBLED OR MODIFIED IN ANY WAY BY THE USER. UNIVERSAL PUNCH CORP. IS NOT RESPONSIBLE FOR DAMAGE ARISING FROM FAILURE TO FOLLOW INSTRUCTIONS RELATING TO THE PRODUCT'S USE. THIS WARRANTY DOES NOT APPLY: (A) TO DAMAGE CAUSED BY NON-UNIVERSAL PUNCH CORP. PRODUCTS; (B) TO DAMAGE CAUSED BY ACCIDENT, ABUSE, MISUSE, FLOOD, FIRE, OR OTHER EXTERNAL CAUSES; (C) TO DAMAGE CAUSED BY OPERATING THE PRODUCT OUTSIDE THE PERMITTED USES DESCRIBED BY UNIVERSAL PUNCH CORP.; (D) TO DAMAGE CAUSED BY SERVICE PERFORMED BY ANYONE OTHER THAN UNIVERSAL PUNCH CORP. TECHNICIANS; (E) TO A GAGE OR GAGE PART THAT HAS BEEN MODIFIED TO SIGNIFICANTLY ALTER FUNCTIONALITY OR CAPABILITY WITHOUT THE WRITTEN PERMISSION OF UNIVERSAL PUNCH CORP.; OR (F) IF ANY SERIAL NUMBER HAS BEEN REMOVED OR DEFACED.

TO THE EXTENT PERMITTED BY LAW, THIS WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, STATUTORY, EXPRESS OR IMPLIED. AS PERMITTED BY APPLICABLE LAW, UNIVERSAL PUNCH CORP. SPECIFICALLY DISCLAIMS ANY AND ALL STATUTORY OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES AGAINST HIDDEN OR LATENT DEFECTS, AND IN NO EVENT WILL UNIVERSAL PUNCH CORP. BE LIABLE FOR ANY SPECIAL, INDIRECT OR COSEQUENTIAL DAMAGES INCLUDING BUT NOT LIMITED TO, LOST PROFITS OR OTHER DAMAGES FROM LOSS OF PRODUCTION CAUSED BY DEFECTIVE PRODUCT, OR BY UNSATISFACTORY PERFORMANCE OF THE PRODUCT. NO UNIVERSAL PUNCH AGENT OR DISTRIBUTOR IS AUTHORIZED TO MAKE ANY MODIFICATION, EXTENSION, OR ADDITION TO THIS WARRANTY. THIS LIMITED WARRANTY IS GOVERNED BY AND CONSTRUED UNDER THE LAWS OF THE COUNTRY AND STATE IN WHICH THE PRODUCT WAS MANUFACTURED.

**OBTAINING WARRANTY SERVICE:** WARRANTY SERVICE CAN ONLY BE OBTAINED DIRECTLY FROM THE MANUFACTURER, UNIVERSAL PUNCH CORP. AND PRIOR MANUFACTURER APPROVAL MUST BE OBTAINED. WARRANTY SERVICE APPLIES TO PARTS THAT ARE TENDERED OR PRESENTED FOR SERVICE DURING THE WARRANTY PERIOD. SERVICE OPTIONS, PARTS AVAILABILITY AND RESPONSE TIMES MAY VARY ACCORDING TO THE PRODUCT BEING RETURNED.

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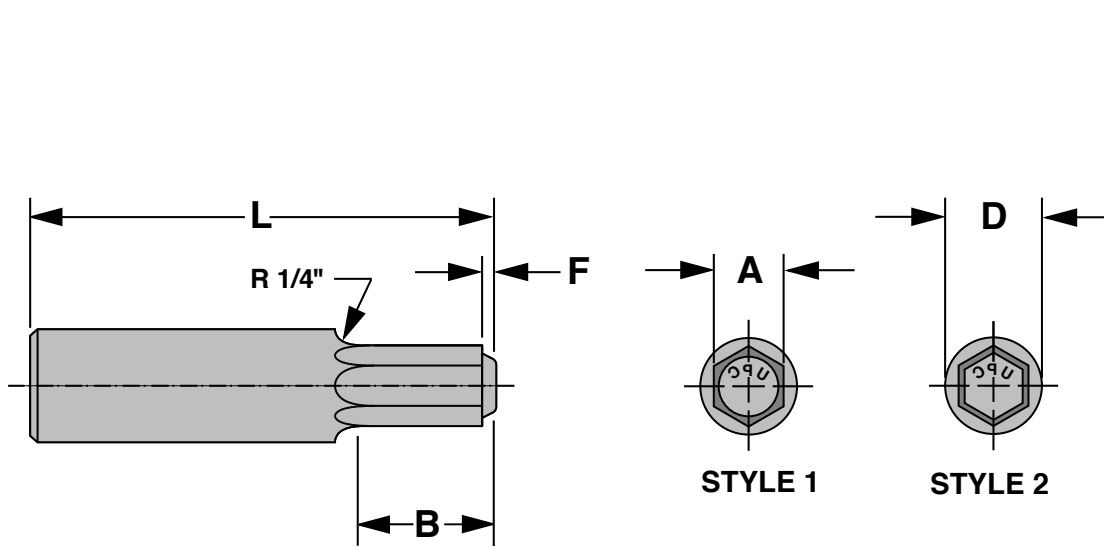
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# #240 HEXAGON WASHER HEAD PINS

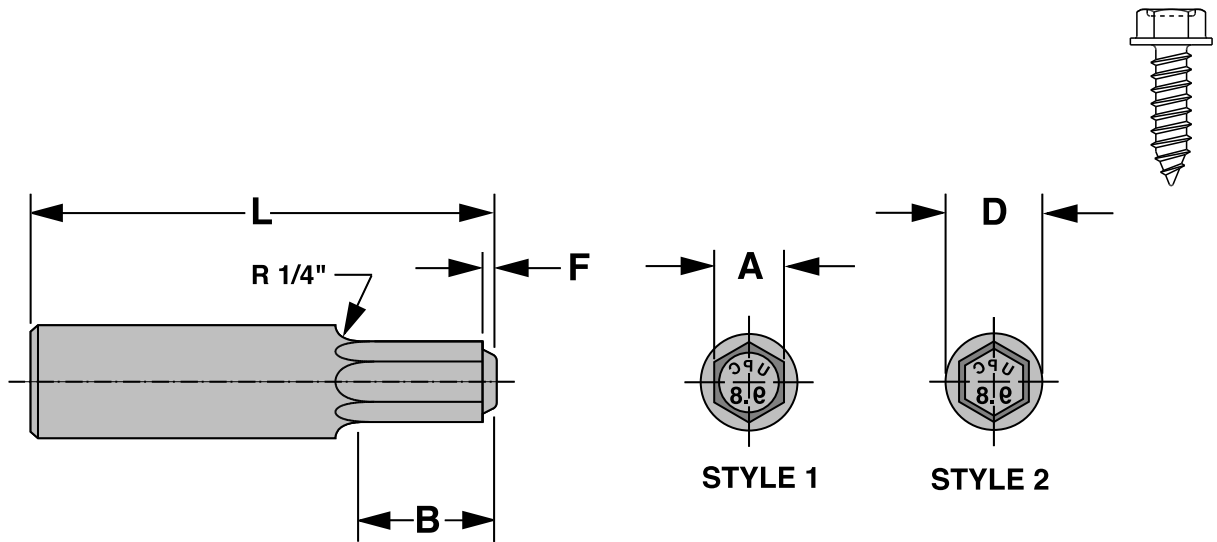


IDENTIFICATION  
OPTIONAL

PART NUMBER STYLE 1	PART NUMBER STYLE 2	SCREW SIZE	HEXAGON SIZE	A	B	D	F	L
240-01	240-02	#2 - #3	1/8"	.199	.500	5/16"	.014	2-1/2"
240-03	240-04	#4 - #5	3/16"	.179	.500	3/8"	.020	2-1/2"
240-05	240-06	#4 - #5	3/16"	.179	.500	5/16"	.020	2-1/2"
240-07	240-08	#6 - #8	1/4"	.242	.562	3/8"	.020	2-1/2"
240-09	240-10	#6 - #8	1/4"	.242	.562	5/16"	.020	2-1/2"
240-11	240-12	#10 - #12	5/16"	.302	.625	3/8"	.030	2-1/2"
240-13	240-14	#10 - #12	5/16"	.302	.750	7/16"	.030	2-1/2"
240-15	240-16	1/4	3/8"	.364	.625	1/2"	.035	2-1/2"
240-17	240-18	1/4	3/8"	.364	.750	1/2"	.037	2-9/16"
240-19	240-20	1/4	7/16"	.425	.750	1/2"	.040	2-9/16"
240-21	240-22	5/16	1/2"	.487	.687	5/8"	.055	2-9/16"
240-23	240-24	3/8	9/16"	.548	.687	5/8"	.055	2-9/16"
240-25	240-26	7/16	5/8"	.607	.937	3/4"	.055	2-9/16"
240-27	240-28	1/2	3/4"	.733	1.000	1"	.065	3"

PRICING AVAILABLE FOR CUSTOM HEAD MARKINGS  
TO ORDER: SPECIFY PART NUMBER AND PIN STYLE  
MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 62-64  
COATINGS: AVAILABLE UPON REQUEST

# #241 METRIC HEXAGON WASHER HEAD PINS



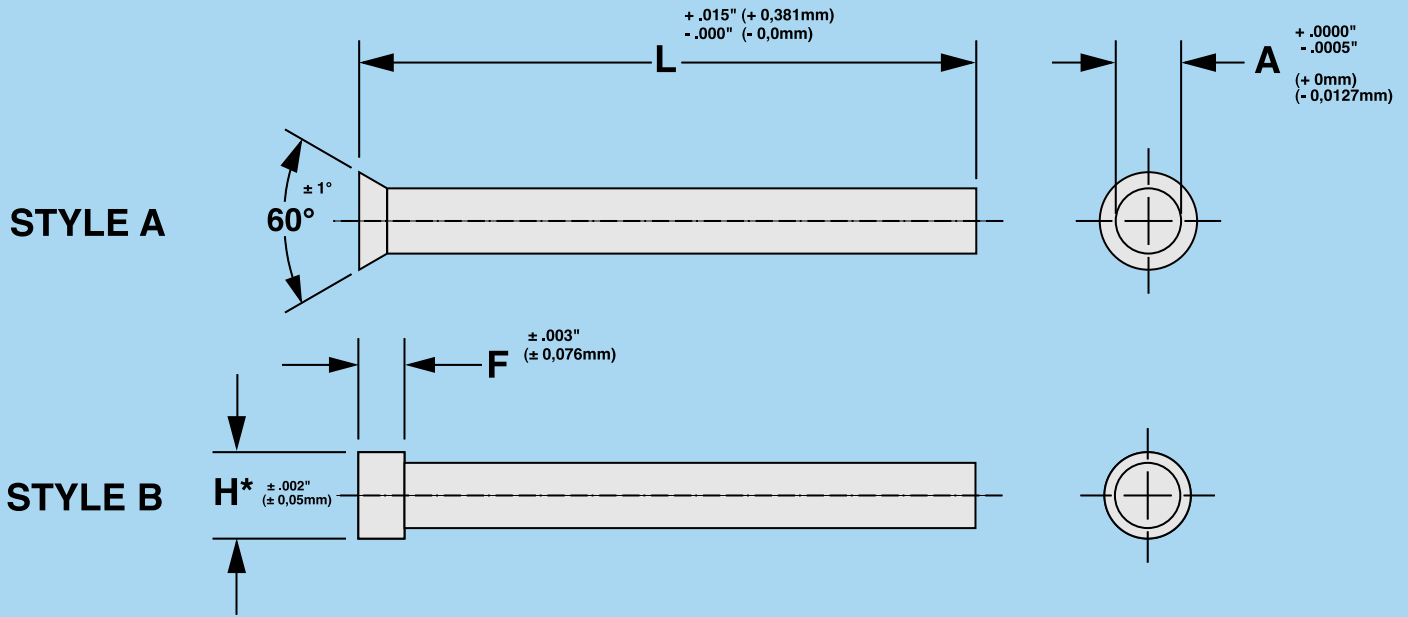
IDENTIFICATION  
OPTIONAL

PART NUMBER STYLE 1	PART NUMBER STYLE 2	SCREW SIZE	HEXAGON SIZE	A	B	D	F	L
241-01	241-02		3.2mm	3.02 / .119	.500	5/16"	.014	2-1/2
241-03	241-04	M3	4.0mm	3.81 / .150	.500	5/16"	.017	2-1/2
241-05	241-06	M3.5	5.0mm	4.80 / .189	.562	5/16"	.020	2-1/2
241-07	241-08	M4	5.5mm	5.31 / .209	.562	3/8"	.020	2-1/2
241-09	241-10		6.0mm	5.79 / .228	.562	5/16"	.020	2-1/2
241-11	241-12	M5	7.0mm	6.73 / .265	.562	3/8"	.023	2-1/2
241-13	241-14		7.3mm	6.73 / .265	.562	7/16"	.023	2-1/2
241-15	241-16	M6	8.0mm	7.74 / 3.05	.562	3/8"	.027	2-1/2
241-17	241-18	M8	10mm	9.73 / .383	.625	1/2"	.040	2-9/16
241-19	241-20		11mm	10.71 / .421	.625	1/2"	.040	2-9/16
241-21	241-22	M10	12mm	11.71 / .461	.687	5/8"	.048	2-9/16
241-23	241-24	M10	13mm	12.67 / .499	.687	5/8"	.048	2-9/16
241-25	241-26	M12	15mm	14.68 / .578	.687	3/4"	.062	2-9/16
241-27	241-28		16mm	15.67 / .617	.687	3/4"	.066	2-9/16
241-29	241-30	M14	17mm	16.64 / .655	.687	3/4"	.070	2-9/16
241-31	241-32		18mm	17.60 / .693	.687	7/8"	.078	2-9/16
241-35	241-34	M16	21mm	20.62 / .812	.687	1"	.078	2-9/16

PRICING AVAILABLE FOR CUSTOM HEAD MARKINGS  
 TO ORDER: SPECIFY PART NUMBER AND PIN STYLE  
 MATERIAL: M-2 HIGH SPEED STEEL  
 HARDNESS: RC 62-64  
 COATINGS: AVAILABLE UPON REQUEST

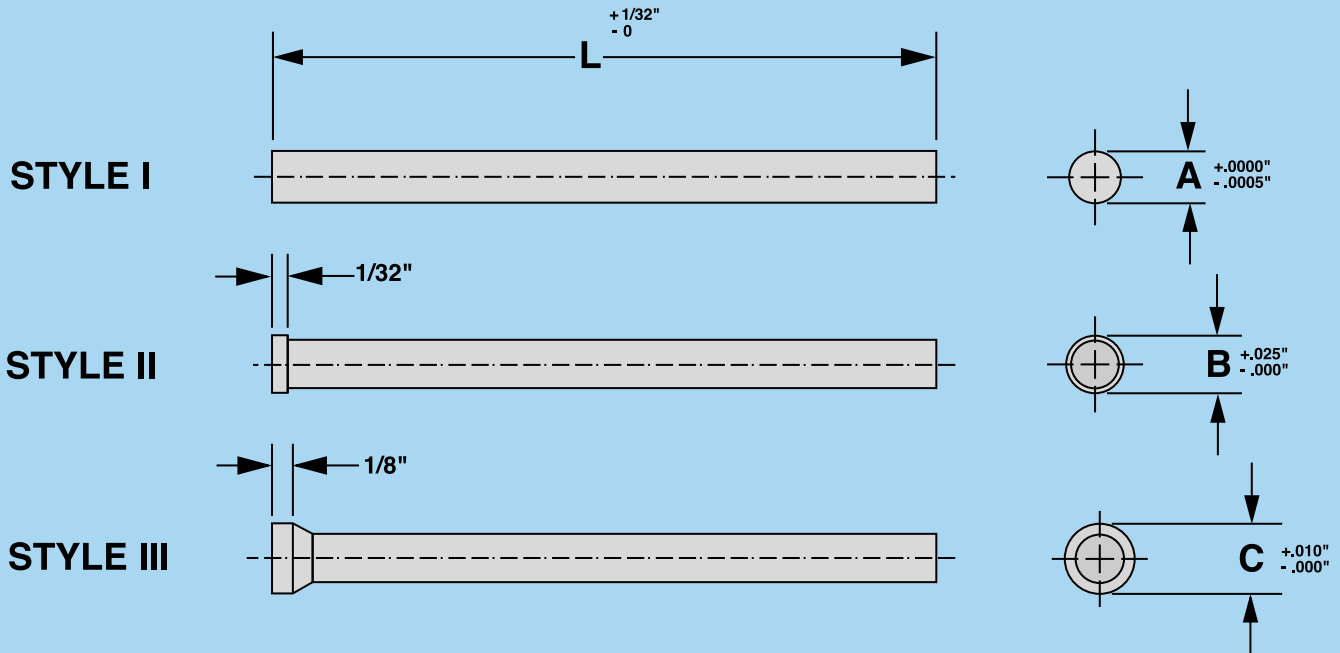


# #250 KNOCKOUT PINS HEADED STYLE A or B



MATERIAL: M-2 HIGH SPEED STEEL  
 HARDNESS: RC 62-64  
 DIAMETER RANGE: .040" THRU 1.25" / 1,02mm THRU 31,75mm  
 ROUNDNESS OR TAPER: WITHIN .0002" / 0,005mm  
 STRAIGHTNESS: WITHIN .001" / 0,025mm  
 \*H DIAMETER FIGURED AT BEING APPROX .050"/.060" LARGER THAN SHANK DIAMETER

# #260 KNOCKOUT PINS HEAD STYLE 1, 2 OR 3



MATERIAL: M-2 HIGH SPEED STEEL  
 HARDNESS: RC 62-64  
 DIAMETER RANGE: .040" THRU 1.25" / 1,02mm THRU 31,75mm  
 ROUNDNESS OR TAPER: WITHIN .0002" / 0,005mm  
 STRAIGHTNESS: WITHIN .001" / 0,025mm

# #266 HARDENED M-2 BLANKS

STOCK 6"/152mm

24HR. SERVICE

PART NUMBER	INCH	METRIC
266-01	.0620 / .1406	1,57 / 3,57
266-02	.1407 / .1719	3,58 / 4,36
266-03	.1720 / .2031	4,37 / 5,15
266-04	.2032 / .2344	5,16 / 5,95
266-05	.2345 / .2500	5,96 / 6,35
266-06	.2501 / .2656	6,36 / 6,74
266-07	.2657 / .2968	6,75 / 7,53
266-08	.2969 / .3281	7,54 / 8,33
266-09	.3282 / .3594	8,34 / 9,12
266-10	.3595 / .3906	9,13 / 9,92
266-11	.3907 / .4219	9,93 / 10,71
266-12	.4220 / .4531	10,72 / 11,50
266-13	.4532 / .4844	11,51 / 12,30
266-14	.4845 / .5151	12,31 / 13,08
266-15	.5152 / .5473	13,09 / 13,90
266-16	.5474 / .5795	13,91 / 14,72



MATERIAL: M-2 HIGH SPEED STEEL, STOCK LENGTH 6" / 152,4mm  
HARDNESS: RC 62-64  
STRAIGHTNESS: WITHIN .001"/ 0,025mm  
TOLERANCE +.0000" / -.0005"

# #268 HARDENED ASP-30 BLANKS

STOCK 8"/203mm

STOCK ITEMS

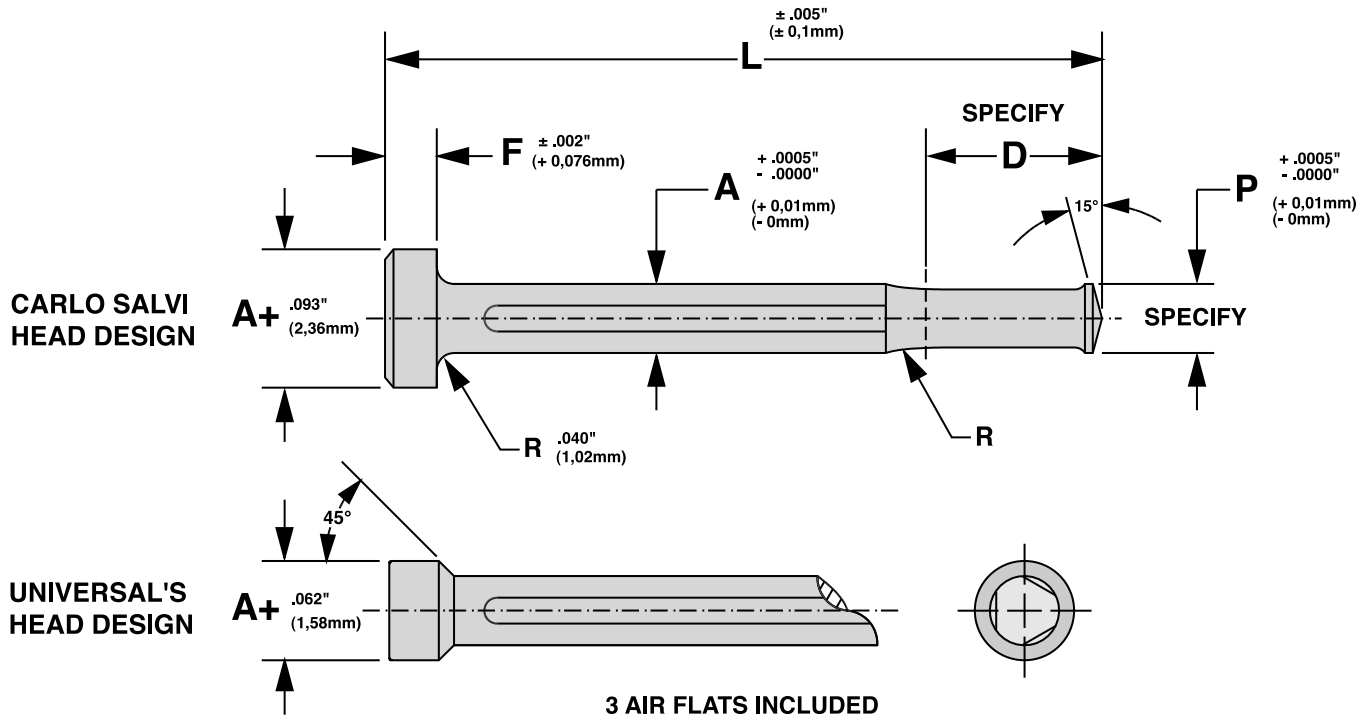
PART NUMBER	INCH	METRIC
268-12	.125	3,17
268-14	.140	3,55
268-15	.156	3,96
268-18	.187	4,74
268-20	.203	5,15
268-21	.218	5,53
268-25	.250	6,35
268-28	.281	7,13
268-31	.312	7,92
268-37	.375	9,52
268-43	.437	11,09
268-50	.500	12,70
268-56	.562	14,27
268-62	.625	15,87
268-75	.750	19,05
268-87	.875	22,22
268-100	1.00	25,40



MATERIAL: ASP-30 SUPER HIGH SPEED STEEL, STOCK LENGTH 8" / 203mm  
HARDNESS: RC 67 MIN. TRIPLE DRAWN  
TOLERANCE WITHIN .0002" / 0,005mm  
ROUNDNESS OR TAPER: WITHIN .0002" / 0,005mm  
STRAIGHTNESS: WITHIN .001"/ 0,025mm

# #310 EXTRUSION PINS

(CARLO SALVI)



PART NUMBER	MACHINE TYPE	A		F		L	
		inch / mm	inch / mm	inch / mm	inch / mm		
310-01	RV / SV	.125 / 3,17	.156 / 3,96	2.02 / 51,30			
310-02	RF / PL	.156 / 3,96	.156 / 3,96	2.42 / 61,46			
310-03	RF / 476 / SV	.187 / 4,74	.156 / 3,96	2.87 / 72,89			
310-04	RF / ML	.187 / 4,74	.177 / 4,49	3.80 / 96,52			
310-05	-	.250 / 6,35	-	-			
310-06	RF / 635 / SL	.187 / 4,74	.177 / 4,49	4.21 / 106,93			
310-07	-	.250 / 6,35	-	-			
310-08	RF / GL	.187 / 4,74	.236 / 5,99	4.33 / 109,98			
310-09	-	.250 / 6,35	-	-			
310-10	-	.312 / 7,92	-	-			
310-11	RF / 873 / SV	.187 / 4,74	.236 / 5,99	5.51 / 139,95			
310-12	-	.250 / 6,35	-	-			
310-13	-	.312 / 7,92	-	-			
310-14	-	.375 / 9,52	-	-			

MATERIAL: M-42 HIGH SPEED STEEL

HARDNESS: RC 64-66 TRIPLE DRAWN

CONCENTRICITY:  $.0002"$  /  $0,005\text{mm}$  SURFACE FINISH: 8 RMS (EXTRUSION ANGLE AND LAND)

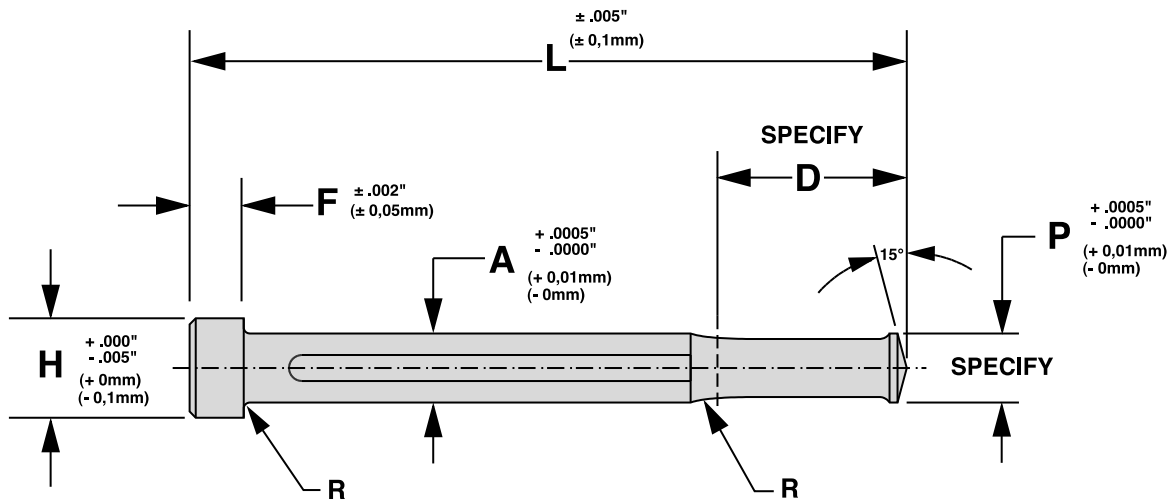
NOTE: FOR STAINLESS ALLOYS ASP-60 IS RECOMMENDED. HARDNESS: RC 68-70

COATINGS: AVAILABLE UPON REQUEST



# #370 EXTRUSION PINS

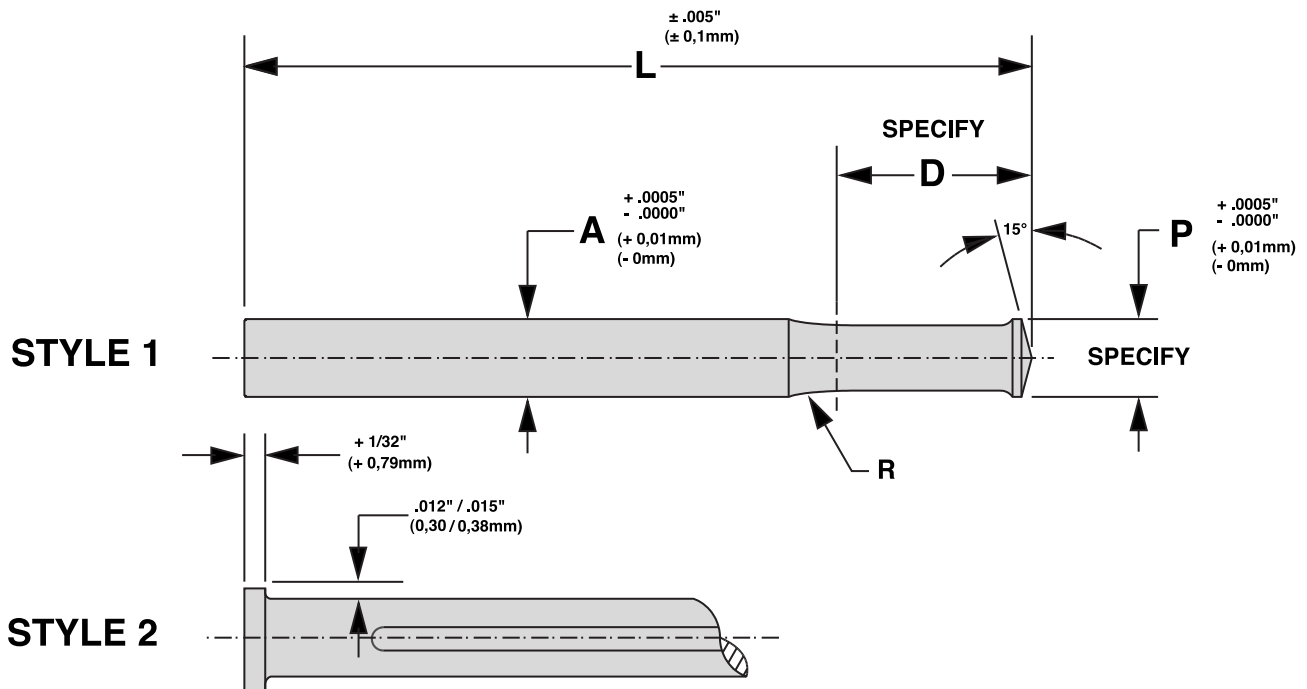
(WATERBURY HEADERS)



OPTIONAL AIR FLATS SHOWN

PART NUMBER	MACHINE TYPE	A		H		F		L	
		inch	mm	inch	mm	inch	mm	inch	mm
370-01	#0	.090	2,28	.187	4,75	.125	3,17	2.0	50,8
370-02	-	.125	3,81						
310-03	#0	.140	3,55	.250	6,35	.187	4,75	2.0	50,8
370-04	-	.187	4,75						
370-05	#0	.187	4,75	.312	7,92	.187	4,75	2.0	50,8
370-06	-	.250	6,35						
370-07	#1	.090	2,28	.187	4,75	.125	3,17	3.0	76,2
370-08	-	.125	3,17						
370-09	#1	.140	3,55	.250	6,35	.187	4,75	3.0	76,2
370-10	-	.187	4,75						
370-11	#1	.187	4,75	.312	7,92	.187	4,75	3.0	76,2
370-12	-	.250	6,35						
370-13	#1	.250	6,35	.375	9,52	.250	6,35	3.0	76,2
370-14	-	.312	7,92						
370-15	#2	.090	2,28	.187	4,75	.125	3,17	4.3	109,2
370-16	-	.125	3,17						
370-17	#2	.140	3,55	.250	6,35	.187	4,75	4.3	109,2
370-18	-	.187	4,75						
370-19	#2	.187	4,75	.312	7,92	.187	4,75	4.3	109,2
370-20	-	.250	6,35						
370-21	#2	.312	7,92	.375	9,52	.250	6,35	4.3	109,2

MATERIAL: M-42 HIGH SPEED STEEL  
HARDNESS: RC 64-66 TRIPLE DRAWN  
CONCENTRICITY: .0002" / 0,005mm SURFACE FINISH: 8 RMS (EXTRUSION ANGLE AND LAND)  
NOTE: FOR STAINLESS ALLOYS ASP-60 IS RECOMMENDED. HARDNESS: RC 68-70  
COATINGS: AVAILABLE UPON REQUEST



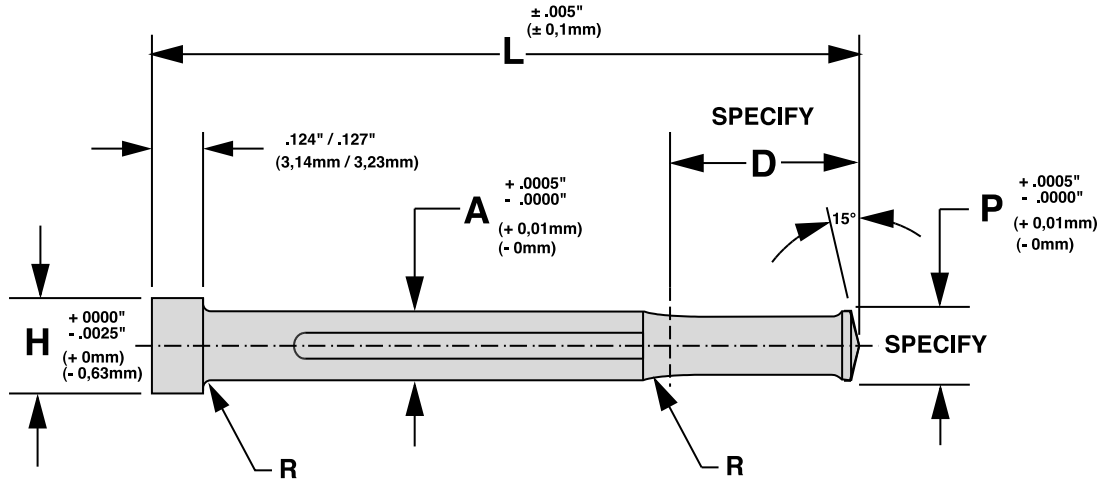
OPTIONAL AIR FLATS SHOWN

PART NUMBER STYLE 1	PART NUMBER STYLE 2	MACHINE TYPE	A inch / mm	L inch / mm
380-01	380-02	#0	.090 / 2,29	2.0 / 50,8
380-03	380-04	-	.125 / 3,18	-
380-05	380-06	-	.187 / 4,75	-
380-07	380-08	-	.250 / 6,35	-
380-09	380-10	#1	.090 / 2,29	3.0 / 76,2
380-11	380-12	-	.125 / 3,18	-
380-13	380-14	-	.187 / 4,75	-
380-15	380-16	-	.250 / 6,35	-
380-17	380-18	#2	.090 / 2,29	4.3 / 111,1
380-19	380-20	-	.125 / 3,18	-
380-21	380-22	-	.187 / 4,75	-
380-23	380-24	-	.250 / 6,35	-
380-25	380-26	#2	.090 / 2,29	5.5 / 139,7
380-27	380-28	-	.125 / 3,18	-
380-29	380-30	-	.187 / 4,75	-
380-31	380-32	-	.250 / 6,35	-

MATERIAL: M-42 HIGH SPEED STEEL  
 HARDNESS: RC 64-66 TRIPLE DRAWN  
 CONCENTRICITY: .0002" / 0,005mm SURFACE FINISH: 8 RMS (EXTRUSION ANGLE AND LAND)  
 NOTE: FOR STAINLESS ALLOYS ASP-60 IS RECOMMENDED. HARDNESS: RC 68-70  
 COATINGS: AVAILABLE UPON REQUEST

# #390 EXTRUSION PINS

(NATIONAL)



OPTIONAL AIR FLATS SHOWN

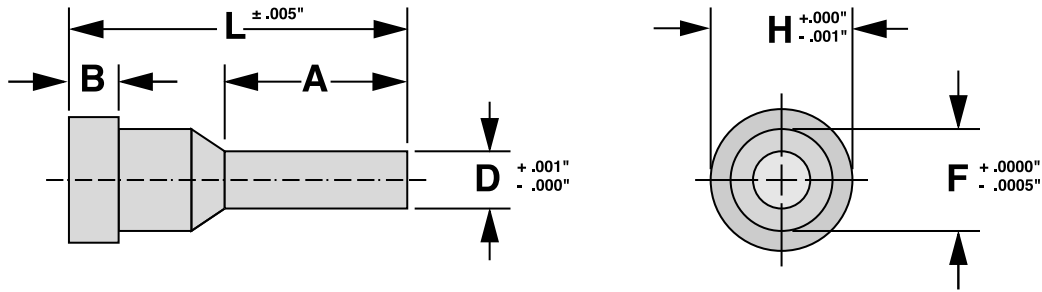
PART NUMBER	A		H		L	
	inch	mm	inch	mm	inch	mm
390-01	.250	6,35	.312	7,92	2.87	72.89
390-02	.187	4,75	-	-	-	-
390-03	.187	4,75	.250	6,35	2.87	72.89
390-04	.140	3,55	-	-	-	-
390-05	.125	3,17	.187	4,75	2.87	72.89
390-06	.090	2,28	-	-	-	-
390-07	.250	6,35	.312	7,92	1.87	47.49
390-08	.187	4,75	-	-	-	-
390-10	.187	4,75	.250	6,35	2.37	60.19
390-11	.140	3,55	-	-	-	-
390-12	.125	3,17	.187	4,75	2.37	60.19
390-13	.090	2,28	-	-	-	-

MATERIAL: M-42 HIGH SPEED STEEL  
 HARDNESS: RC 64-66 TRIPLE DRAWN  
 CONCENTRICITY: .0002" / 0,005mm SURFACE FINISH: 8 RMS (EXTRUSION ANGLE AND LAND)  
 NOTE: FOR STAINLESS ALLOYS ASP-60 IS RECOMMENDED. HARDNESS: RC 68-70  
 COATINGS: AVAILABLE UPON REQUEST



# #415 KNOCKOUT PUNCHES

1ST STATION (NATIONAL)

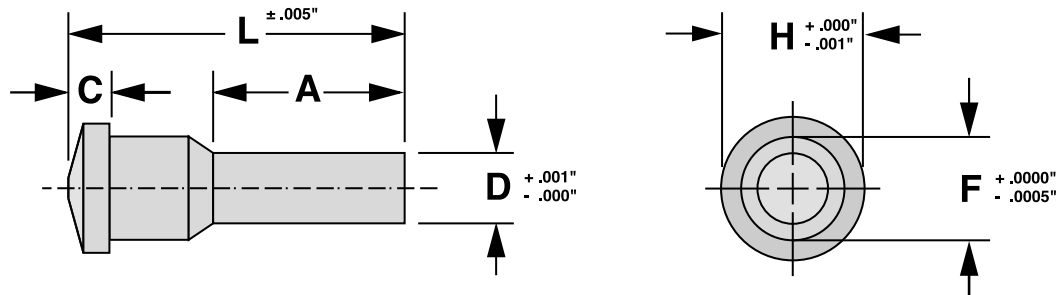


PART NUMBER	NUT TYPE	MACHINE SIZE	A		B		D		F		H		L	
			inch / mm	inch / mm	inch / mm	inch / mm	inch / mm	inch / mm	inch / mm	inch / mm	inch / mm	inch / mm		
415-01	1/4 REG.	5/16"	1.187 / 30,15	.250 / 6,35	.378 / 9,60	.546 / 13,86	.810 / 20,57	2.000 / 50,80						
415-02	1/4 HEAVY	5/16"	1.187 / 30,15	.250 / 6,35	.440 / 11,18	.546 / 13,86	.810 / 20,57	2.000 / 50,80						
415-03	5/16 REG.	5/16"	1.187 / 30,15	.250 / 6,35	.498 / 12,65	.546 / 13,86	.810 / 20,57	2.000 / 50,80						
415-04	5/16 HEAVY	3/8"	1.187 / 30,15	.250 / 6,35	.498 / 12,65	.546 / 13,86	.810 / 20,57	2.000 / 50,80						
415-05	3/8 REG.	3/8"	1.332 / 33,83	.312 / 7,92	.521 / 13,23	.562 / 14,27	.936 / 23,77	2.250 / 57,15						
415-06	3/8 HEAVY	1/2"	1.332 / 33,83	.312 / 7,92	.551 / 13,99	.562 / 14,27	.936 / 23,77	2.250 / 57,15						
415-07	7/16 REG.	1/2"	1.750 / 44,45	.375 / 9,52	.581 / 14,76	.703 / 17,85	1.120 / 2,44	2.620 / 66,54						
415-08	7/16 HEAVY	1/2"	1.750 / 44,45	.375 / 9,52	.685 / 17,40	.703 / 17,85	1.120 / 28,44	2.620 / 66,54						

MATERIAL: M-2 HSS RC 62-64  
 MATERIAL: M-42 HSS RC 64-66  
 COATINGS: AVAILABLE UPON REQUEST

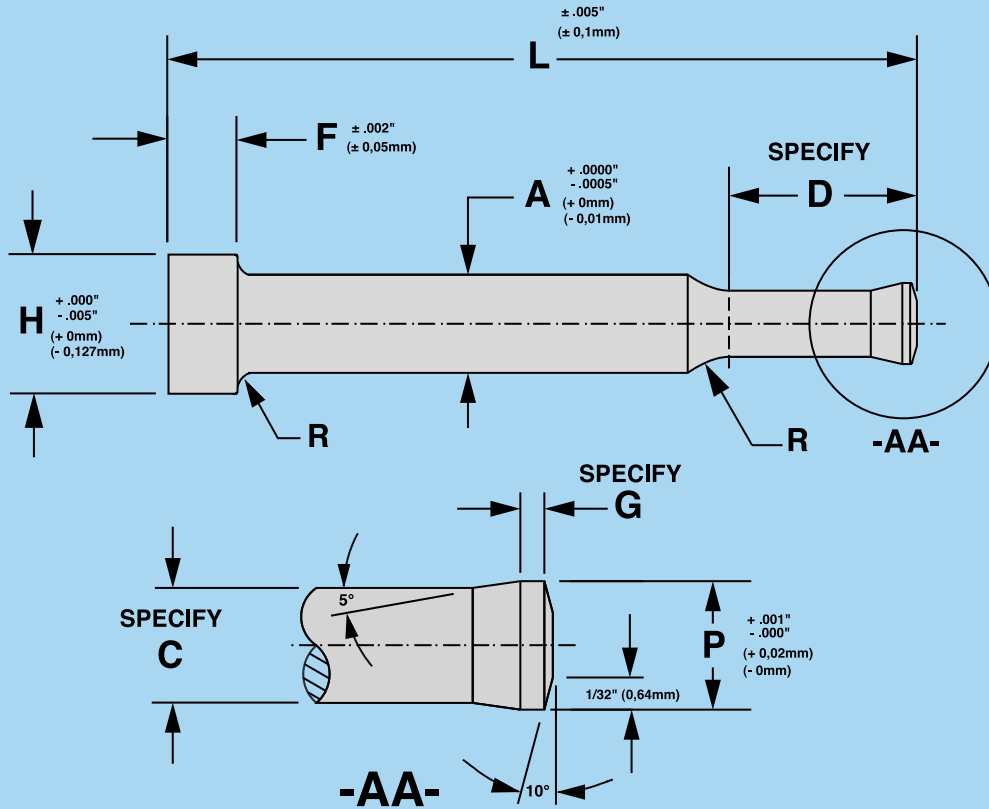
# #420 STOCK GAGE PUNCHES

1ST STATION (NATIONAL)



PART NUMBER	NUT TYPE	MACHINE SIZE	A		C		D		F		H		L	
			inch / mm	inch / mm	inch / mm	inch / mm	inch / mm	inch / mm	inch / mm	inch / mm	inch / mm	inch / mm		
420-01	1/4 REG.	5/16"	1.65 / 41,9	.156 / 3,96	.406 / 10,31	.562 / 14,28	.750 / 19,05	2.43 / 61,90						
420-02	1/4 HEAVY	5/16"	1.65 / 41,9	.156 / 3,96	.463 / 11,76	.562 / 14,28	.750 / 19,05	2.43 / 61,90						
420-03	5/16 REG.	5/16"	1.65 / 41,9	.156 / 3,96	.521 / 13,23	.562 / 14,28	.750 / 19,05	2.43 / 61,90						
420-04	5/16 HEAVY	3/8"	1.81 / 45,9	.156 / 3,96	.521 / 13,23	.593 / 15,08	.937 / 23,81	2.81 / 71,42						
420-05	3/8 REG.	3/8"	1.81 / 46,0	.187 / 4,75	.580 / 14,73	.593 / 15,08	.937 / 23,81	2.81 / 71,42						
420-06	3/8 HEAVY	1/2"	2.00 / 50,8	.187 / 4,75	.639 / 16,23	.781 / 19,84	1.125 / 28,57	3.06 / 77,77						
420-07	7/16 REG.	1/2"	2.00 / 50,8	.187 / 4,75	.698 / 17,73	.781 / 19,84	1.125 / 28,57	3.06 / 77,77						
420-08	7/16 HEAVY	1/2"	2.00 / 50,8	.187 / 4,75	.698 / 17,73	.781 / 19,84	1.125 / 28,57	3.06 / 77,77						

MATERIAL: M-2 HSS RC 62-64  
 MATERIAL: M-42 HSS RC 64-66  
 COATINGS: AVAILABLE UPON REQUEST

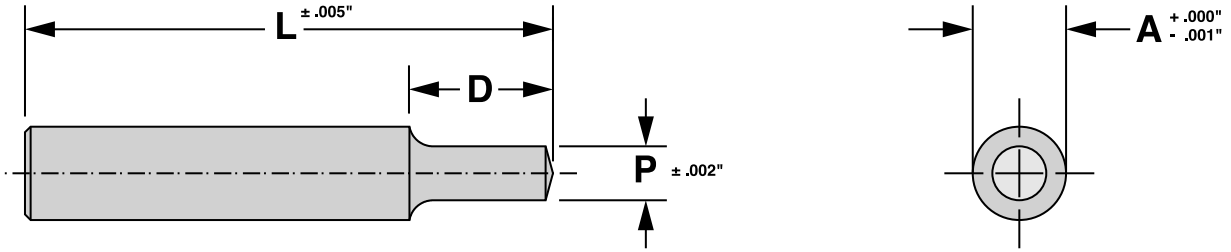


PART NUMBER	NUT SIZE	MACHINE SIZE	A		P		F		H		L	
			inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
430-01	1/4-20	1/4"	.249	6,32	.206	5,23	.250	6,35	.312	7,92	2.37	60,19
430-02	1/4-28	-	-	-	.220	5,58	-	-	-	-	-	-
430-03	5/16-18	5/16"	.340	8,63	.263	6,68	.250	6,35	.468	11,88	2.75	69,85
430-04	5/16-24	-	-	-	.274	6,96	-	-	-	-	-	-
430-05	3/8-16	-	-	-	.317	8,05	-	-	-	-	-	-
430-06	3/8-24	-	-	-	.336	8,53	-	-	-	-	-	-
430-07	3/8-16	3/8"	.406	10,31	.317	8,05	.312	7,92	.500	12,70	3.31	84,07
430-08	3/8-24	-	-	-	.336	8,53	-	-	-	-	-	-
430-09	7/16-14	-	-	-	.371	9,42	-	-	-	-	-	-
430-10	7/16-20	-	-	-	.390	9,90	-	-	-	-	-	-
430-11	7/16-14	1/2"	.467	11,87	.371	9,42	.375	9,52	.562	14,27	4.00	101,60
430-12	7/16-20	-	-	-	.390	9,90	-	-	-	-	-	-
430-13	1/2-13	-	-	-	.429	10,89	-	-	-	-	-	-
430-14	1/2-20	-	-	-	.453	11,50	-	-	-	-	-	-
430-15	5/8-11	5/8"	.594	15,08	.509	12,92	.719	18,26	.750	19,05	4.87	123,69
430-16	5/8-18	-	-	-	.573	14,55	-	-	-	-	-	-

**MATERIAL: M-2 HIGH SPEED STEEL**  
**HARDNESS: RC 62-64 TRIPLE DRAWN**  
**CONCENTRICITY: .002" / 0,05mm**  
**SURFACE FINISH: 8 RMS (EXTRUSION ANGLE AND LAND)**  
**NOTE: OTHER MATERIALS QUOTED UPON REQUEST**  
**COATINGS: AVAILABLE UPON REQUEST**

# #480 NUT FORMING PUNCHES

2ND STATION (NATIONAL)

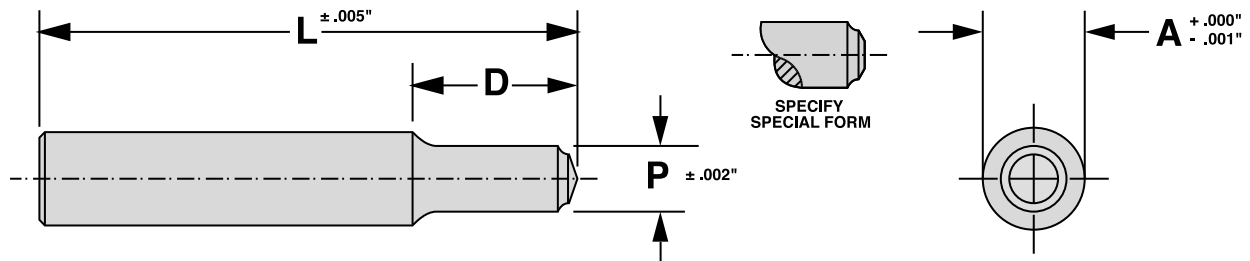


PART NUMBER	NUT TYPE	MACHINE SIZE	A		P		D		L	
			inch	mm	inch	mm	inch	mm	inch	mm
480-250	REGULAR	1/4"	.625	15,87	.411	10,94	.812	20,62	3.31	84,0
480-251	HEAVY	-	-	-	.470	11,94	-	-	-	-
480-312	REGULAR	5/16"	.687	17,45	.470	11,94	.968	24,58	3.50	88,9
480-313	HEAVY	-	-	-	.528	13,41	-	-	-	-
480-375	REGULAR	3/8"	.750	19,05	.528	13,41	1.125	28,57	4.00	101,6
480-376	HEAVY	-	-	-	.588	14,93	-	-	-	-
480-500	REGULAR	1/2"	.937	23,80	.705	17,90	1.281	32,53	4.75	120,6
480-501	HEAVY	-	-	-	.765	19,43	-	-	-	-
480-625	REGULAR	5/8"	1.187	30,15	.826	20,98	1.500	38,10	5.56	141,2
480-626	HEAVY	-	-	-	.893	22,68	-	-	-	-

MATERIAL: M-2 HSS RC 62-64  
 MATERIAL: M-42 HSS RC 64-66  
 COATINGS: PVD OR CVD AVAILABLE UPON REQUEST

# #490 NUT FORMING PUNCHES

3RD & 4TH STATION (NATIONAL)



PART NUMBER	NUT TYPE	MACHINE SIZE	A		P		D		L	
			inch	mm	inch	mm	inch	mm	inch	mm
490-250	REGULAR	1/4"	.625	15,87	.420	10,66	.812	20,62	3.31	84,0
490-251	HEAVY	-	-	-	.480	12,19	-	-	-	-
490-312	REGULAR	5/16"	.687	17,45	.480	12,19	.968	24,58	3.50	88,9
490-313	HEAVY	-	-	-	.540	13,71	-	-	-	-
490-375	REGULAR	3/8"	.750	19,05	.540	13,71	1.125	28,57	4.00	101,6
490-376	HEAVY	-	-	-	.600	15,24	-	-	-	-
490-500	REGULAR	1/2"	.937	23,80	.720	18,28	1.281	32,53	4.75	120,6
490-501	HEAVY	-	-	-	.780	19,81	-	-	-	-
490-625	REGULAR	5/8"	1.187	30,15	.840	21,33	1.500	38,10	5.56	141,2
490-626	HEAVY	-	-	-	.905	22,98	-	-	-	-

MATERIAL: M-2 HSS RC 62-64  
 MATERIAL: M-42 HSS RC 64-66  
 COATINGS: PVD OR CVD AVAILABLE UPON REQUEST



**UNIVERSAL'S PIERCING PUNCHES** are used for punching and cutting holes in sheet made from metal and other materials. Piercing punches are precision component press tools which are subjected to the highest stress. Their advantages and full capacity can only be fully demonstrated if all other components in the press tool are also precision made.

**UNIVERSAL PIERCING PUNCHES** are known for their quality and great life expectancy in all appropriate industries. They are produced according to various standards and customers' drawings: Piercing punches according to DIN 9861, part 1 and 2 are manufactured with 60° countersunk head: Type DA (parallel) and CA (with stepped shaft) are standard designs, in which the 60° countersunk head is precision ground. As the flowlines of the material are continuous, these parts can withstand great stress on the return stroke. These standard parts will permit swelling immediately under the head of max. 0.02 - 0.04 mm. Types D and C are plunge cut ground in one piece, whereby the tolerance h6 is maintained over the whole length of the shaft and the head. A perfect fit of the punch head in the tool fixture is only guaranteed if these precision parts are positioned in precise mounting boreholes. To facilitate higher cutting and withdrawal force, we recommend punches of type CA or C, as these have larger punch profiles for the resulting forces. For piercing printed circuit boards, piercing punches are manufactured in accordance with DIN 9861 with highly precision ground surface (Rz 0.4 - 0.6 µ).

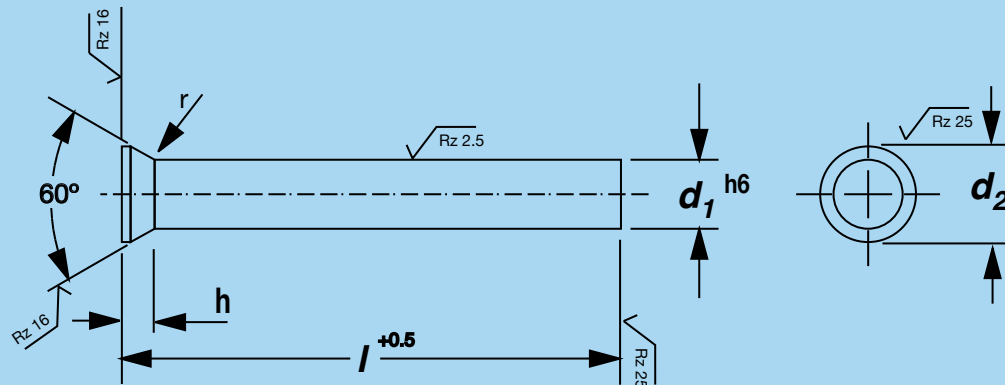
**UNIVERSAL PUNCH CORP.** has been offering piercing punches with bottle neck and trombone neck heads over many years. The largely expanded radius will reduce the danger of breakdown under the head even further. Piercing punches according to ISO 8020 are produced with cylindrical head in types A / B / E and F. They are basically plunge cut ground.

Piercing punches type A and B with cylindrical head (according to DIN 9844) are also plunge cut ground. In contrast to ISO 8020, a wider diameter range is available. Piercing punches DIN 9840, Part 1 and 2 are specially made for cutting sheet metal perforations. The 40° countersunk head, used for this purpose, facilitates close positioning of the punches due to less space requirement in the tool fixture providing less danger of fracture under the head. Square/rectangular and profile punches in accordance with DIN 9846 are available with or without head, with transverse hole or tapped blind hole. Over and above they can be produced according to customers' drawings. For the different applications we use the following materials: WS with average wear resistance x HWS with high wear resistance x HSS with extremely high wear resistance or for difficult to work materials x ASP 30 with excellent wear resistance.

For tools subjected to very high demands in the electrotechnical and electronics industry, especially powder metallurgy manufactured steel, HSS steel ASP 30 & 60 /ASP 2060/CPM 10V/CPMREX M4 has gained acceptance.

By using a surface coating, the life expectancy can be greatly extended. **UNIVERSAL** recommends the use of TIN coatings, which can save the tool maker a great deal of money by extending the life expectancy of the piercing punches considerably.

Today, we mainly offer the following coatings: TIN (PVD) colour: gold-yellow (2200 - 2400 HV 0.05) TICN (PVD) Colour: blue-grey (approx. 3000 HV 0.05) Tenifer-bath nitrated, colour: grey-black (approx. 1000 HV 0.3 = 70 HRC).



**Range of Application:** For press tools used for piercing/cutting sheet, steel, non-ferrous metals, plastics, paper, for basic printed circuit board material.

**Size/Head Size:** To order specify  $d_1$ ,  $d_2$ ,  $l$  and  $h$

**Fit/Tolerances:** Nominal diameter  $d_1$  (shaft)

h6	0,50 - 3,00 Ø	≥3,00 - 6,00 Ø	≥6,00 - 10,0 Ø	≥10,0 - 18,0 Ø	≥18,0 - 20,0 Ø
	- 0,006	- 0,008	- 0,009	- 0,011	- 0,013

Length: total  $l + 0,5$

**Material:** HSS: High Speed Steel  
ASP30: Powder metallurgy manufactured High Speed Steel

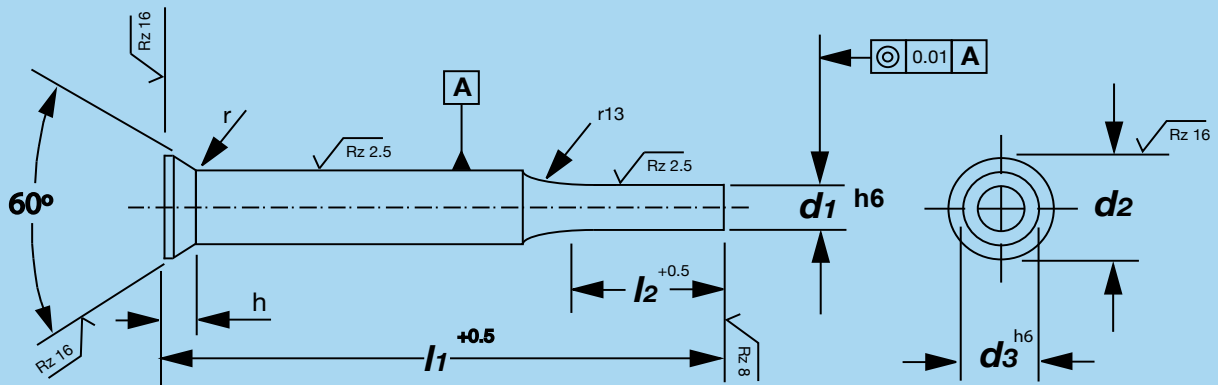
**Material Properties:** HSS: For working high strength or difficult to work materials. Very abrasion proof high tensile strength and high heat resistance.  
ASP30: A noticeable increase in the life expectancy, e.g. when piercing stainless materials.

		<u>HSS</u>	<u>ASP 30</u>
<b>Hardness:</b>	Shaft:	HRC 62 - 64	65 - 67
	Head:	HRC 45 - 55	48 - 55

**Finish:** Hardened, annealed, 60° countersunk precision ground, subsequently the shaft is plunge cut ground over the whole length including the 60° countersunk, head surface ground.

**Note:** HSS piercing punches can be treated with a special surface coating on request.





**Range of Application:** For press tools used for piercing/cutting sheet, steel, non-ferrous metals, plastics, paper, for basic printed circuit board material.

**Size/Head Size:** To order specify  $d_1$ ,  $d_2$ ,  $d_3$ ,  $k$ ,  $l_1$ ,  $l_2$

**Fit/Tolerances:** Nominal diameter  $d_1$  (step) Nominal diameter  $d_3$  (shaft)

h6	0,05 - 3,00 Ø	≥3,00 - 6,00 Ø
	- 0,006	- 0,008

h6	1,50 - 3,00 Ø	≥3,00 - 6,00 Ø
	-0,006	- 0,008

Length: total  $l_1$  +0,5  
step  $l_2$  + 0,05

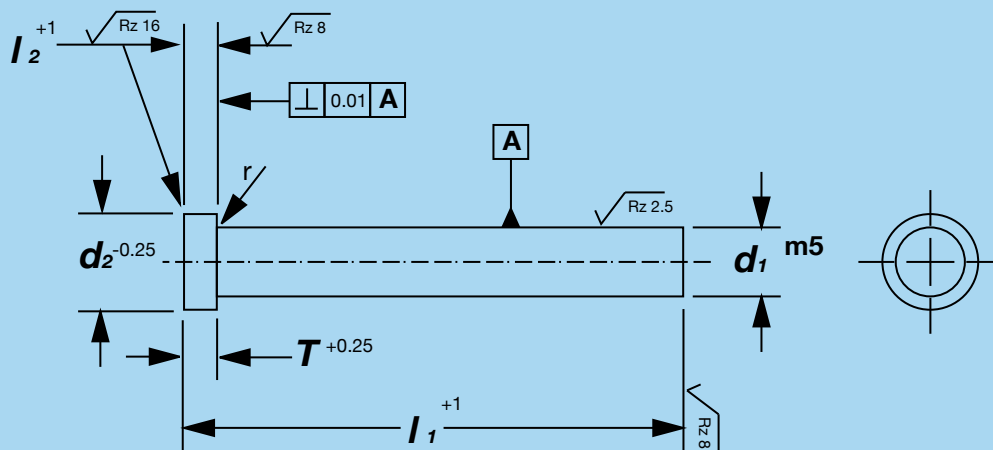
**Material:** HSS: High Speed Steel  
ASP30: Powder metallurgy manufactured High Speed Steel

**Material Properties:** HSS: For working high strength or difficult to work materials. Very abrasion proof high tensile strength and high heat resistance.  
ASP30: A noticeable increase in the life expectancy, e.g. when piercing stainless materials.

		HSS	ASP 30
Hardness:	Shaft: HRC	62 - 64	65 - 67
	Head: HRC	45 - 55	48 - 55

**Finish:** Hardened, annealed, 60° countersunk precision ground, subsequently the shaft is plunge cut ground over the whole length including the 60° countersunk, head surface ground.

**Note:** HSS piercing punches can be treated with a special surface coating on request.



**Range of Application:** For press tools used mainly for piercing/cutting perforations into sheet steel.

**Size/Head Size:** To order specify  $d_1$ ,  $d_2$ ,  $T$ ,  $l_1$ ,  $l_2$

**Fit/Tolerances:** Nominal diameter  $d_1$  (shaft)

m5	3 Ø	4 + 5 + 6 Ø	8 + 10 Ø	13 + 16 Ø	20 + 25 Ø	32 Ø
	+ 0,006 + 0,002	+ 0,009 + 0,004	+ 0,012 + 0,006	+ 0,015 + 0,007	+ 0,017 + 0,008	+ 0,020 + 0,009

Length: total  $l_1^{+1}$

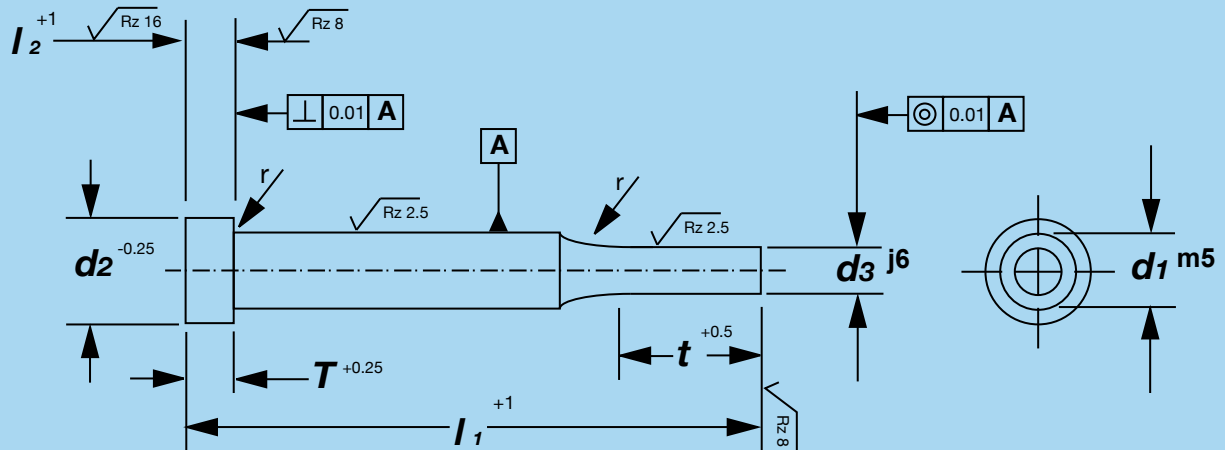
**Material:** HSS: High Speed Steel  
ASP30: Powder metallurgy manufactured High Speed Steel

**Material Properties:** HSS: For working high strength or difficult to work materials. Very abrasion proof high tensile strength and high heat resistance.  
ASP30: A noticeable increase in the life expectancy, e.g. when piercing stainless materials.

		<u>HSS</u>	<u>ASP 30</u>
<b>Hardness:</b>	Shaft:	HRC 62 - 64	65 - 67
	Head:	HRC 45 - 55	48 - 55

**Finish:** Hardened, annealed, 60° countersunk precision ground, subsequently the shaft is plunge cut ground over the whole length including the 60° countersunk, head surface ground.

**Note:** HSS piercing punches can be treated with a special surface coating on request.



**Range of Application:** For press tools used mainly for piercing/cutting perforations into sheet steel.

**Size/Head Size:** To order specify  $d_1$ ,  $d_2$ ,  $d_3$ ,  $T$ ,  $l_1$ ,  $l_2$

**Fit/Tolerances:** Nominal diameter  $d_3$  (step)

<b>j6</b>	0,8 - 3 Ø	≤ 3 - 6 Ø	≤ 6 - 10 Ø	≤ 10 - 18 Ø	≤ 18 - 30 Ø	≤ 30 - 31.9 Ø
	+ 0,004 + 0,002	+ 0,006 + 0,002	+ 0,007 + 0,002	+ 0,008 + 0,003	+ 0,009 + 0,004	+ 0,011 + 0,005

Nominal diameter  $d_1$  (shaft)

<b>m5</b>	3 Ø	4 + 5 + 6 Ø	8 + 10 Ø	13 + 16 Ø		32 Ø
	+ 0,006 + 0,002	+ 0,009 + 0,004	+ 0,012 + 0,006	+ 0,015 + 0,007	+ 0,017 + 0,008	+ 0,020 + 0,009

Length: Total  $l_1+1$   
Step  $l_1$  +0,5

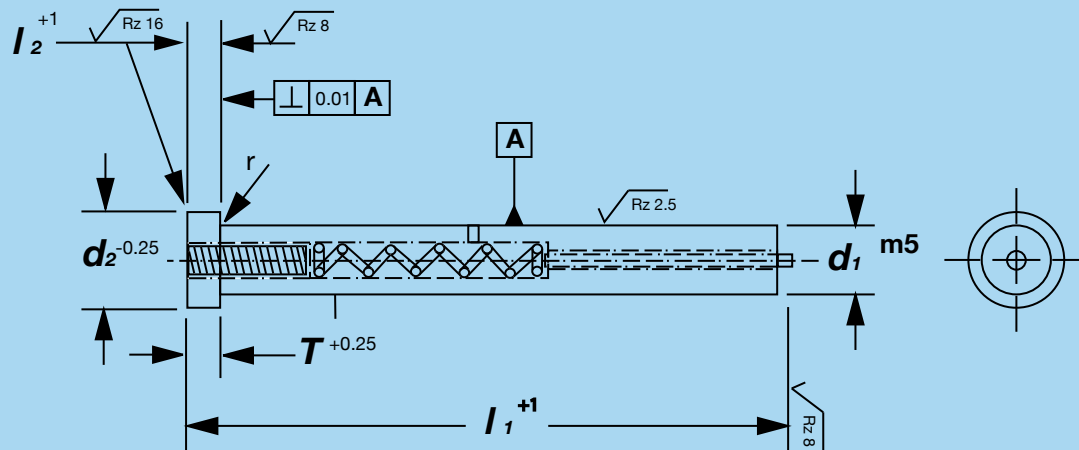
**Material:** HSS: High Speed Steel  
ASP30: Powder metallurgy manufactured High Speed Steel

**Material Properties:** HSS: For working high strength or difficult to work materials. Very abrasion proof high tensile strength and high heat resistance.  
ASP30: A noticeable increase in the life expectancy, e.g. when piercing stainless materials.

		<u>HSS</u>	<u>ASP 30</u>
<b>Hardness:</b>	Shaft:	HRC 62 - 64	65 - 67
	Head:	HRC 45 - 55	48 - 55

**Finish:** Hardened, annealed, 60° countersunk head precision ground, subsequently the shaft is plunge cut ground over the whole length including the 60° countersunk, head surface ground.

**Note:** HSS piercing punches can be treated with a special surface coating on request.



**Range of Application:** For press tools used mainly for piercing/cutting perforations into sheet steel. Especially suitable for the rapid ejection of punch blanks.

**Size/Head Size:** To order specify  $d_1$ ,  $d_2$ ,  $T$ ,  $l_1$ ,  $l_2$

**Fit/Tolerances:** Nominal diameter  $d_1$  (shaft)

m5	5 + 6 Ø	8 + 10 Ø	13 + 16 Ø	20 + 25 Ø	32 Ø
	+ 0.009 + 0.004	+ 0.012 + 0.006	+ 0.015 + 0.007	+ 0.017 + 0.008	+ 0.020 + 0.009

Length: total  $l_1$

Note: All other tolerances, see illustration and table respectively for non-specified tolerances in accordance with ISO2768-m

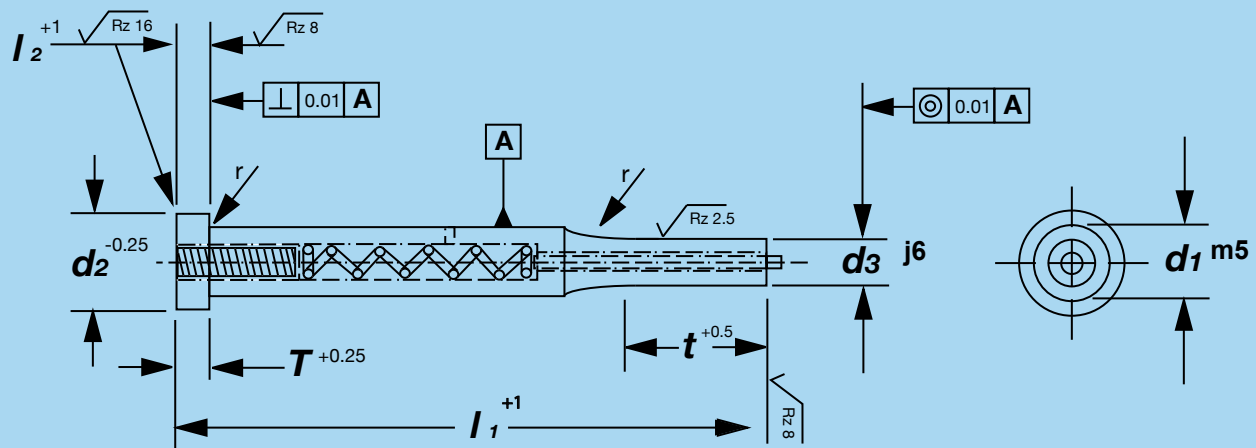
**Material:** HSS: High Speed Steel

**Material Properties:** HSS: For working high strength or difficult to work materials. Very abrasion proof high tensile strength and high heat resistance.

**Hardness:** HSS  
 Shaft: HRC 62 - 64  
 Head: HRC 45 - 55

**Finish:** Hardened, annealed, cylinder head precision ground, subsequently the shaft is plunge cut ground over the whole length including the underneath part of the head. Head surface ground.

**Note:** These piercing punches come complete with special threaded compression springs, setscrew and ejector. The spring tension of the draw-off pin is adjustable at the setscrew on the head. HSS piercing punches can be treated with a special surface coating on request.



**Range of Application:** For press tools used mainly for piercing/cutting perforations into sheet steel.

**Size/Head Size:** To order specify  $d_1$ ,  $d_2$ ,  $d_3$ ,  $T$ ,  $t$ ,  $l_1$ ,  $l_2$

**Fit/Tolerances:** Nominal diameter  $d_3$  (step)

j6	1,6 - 3 Ø	≤ 3 - 6 Ø	≤ 6 - 10 Ø	≤ 10 - 18 Ø	≤ 18 - 30 Ø	≤ 30 - 31.9 Ø
	+ 0,004 + 0,002	+ 0,006 + 0,002	+ 0,007 + 0,002	+ 0,008 + 0,003	+ 0,009 + 0,004	+ 0,011 + 0,005

Nominal diameter  $d_1$  (shaft)

m5	3 Ø	5 + 6 Ø	8 + 10 Ø	13 + 16 Ø	20 + 25 Ø	32 Ø
	+ 0,009 + 0,004	+ 0,009 + 0,004	+ 0,012 + 0,006	+ 0,015 + 0,007	+ 0,017 + 0,008	+ 0,020 + 0,009

Length: Total  $l_1$  +1  
Step  $l_1$  +0,5

**Material:** HSS: High Speed Steel

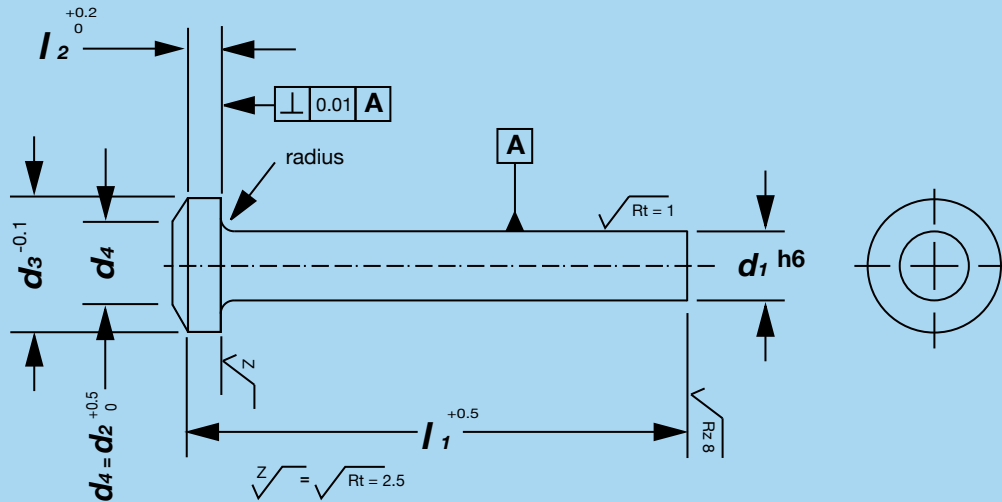
**Material Properties:** HSS: For working high strength or difficult to work materials. Very abrasion proof high tensile strength and high heat resistance.

**Hardness:** HSS  
Shaft: HRC 62 - 64  
Head: HRC 45 - 55

**Finish:** Hardened, annealed, cylinder head precision ground, subsequently the shaft is plunge cut ground over the whole length including the underneath part of the head. Head surface ground.

**Note:** These piercing punches come complete with special threaded compression springs, setscrew and ejector. The spring tension of the draw-off pin is adjustable at the setscrew on the head. HSS piercing punches can be treated with a special surface coating on request.





**Range of Application:** For press tools used mainly for piercing/cutting perforations into sheet steel.

**Size/Head Size:** To order specify  $d_1$ ,  $d_2$ ,  $d_3$ ,  $d_4$ ,  $l_1$  and  $l_2$

**Fit/Tolerances:** Nominal diameter  $d_1$  (shaft)

h6	2,00 - 3,00 Ø	≤ 2,00 - 6,00 Ø	≤ 6,00 - 10,00 Ø	≤ 10,00 - 16,00 Ø
	- 0,006	- 0,008	- 0,009	- 0,011

Length: total  $l_1$

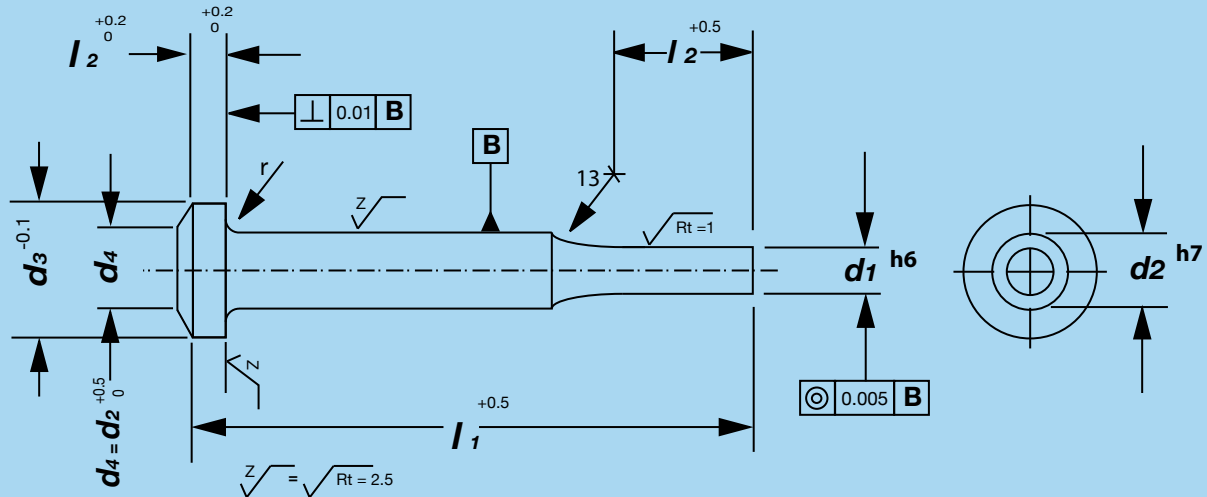
**Material:** HSS: High Speed Steel  
ASP30: Powder metallurgy manufactured High Speed Steel

**Material Properties:** HSS: For working high strength or difficult to work materials. Very abrasion proof high tensile strength and high heat resistance.  
ASP30: A noticeable increase in the life expectancy, e.g. when piercing stainless materials.

		<u>HSS</u>	<u>ASP 30</u>
<b>Hardness:</b>	Shaft:	HRC 62 - 64	65 - 67
	Head:	HRC 45 - 55	48 - 55

**Finish:** Hardened, annealed, 60° countersunk precision ground, subsequently the shaft is plunge cut ground over the whole length including the 60° countersunk, head surface ground.

**Note:** These piercing punches are designed for moving punch holding devices in the die. They are designed, contrary to piercing punches with conical head, for level coating areas at the punch holding plate. By allowing adequate tolerance clearance between piercing punch, punch holding plate and pressure plate, the bending stresses, which will occur due to misalignment in rigid installations, can therefore be avoided. The main measurements are based on standard figures and take into account a supporting flange at the head of the piercing punch, which will permit stripping of piercing particles or stripes without plasticised deforming of the punch holding plate.



**Range of Application:** For press tools used mainly for piercing/cutting perforations into sheet steel.

**Size/Head Size:** To order specify  $d_1$ ,  $d_2$ ,  $d_3$ ,  $d_4$ ,  $l_1$  and  $l_2$

**Fit/Tolerances:** Nominal diameter  $d_1$  (step)

h6	0,50 - 3,00 Ø	≤ 3,00 - 6,00 Ø	≤ 6,00 - 10,00 Ø	≤ 10,00 - 15,90 Ø
	- 0,006	- 0,008	- 0,009	- 0,011

Nominal diameter  $d_2$  (shaft)

h7	2 + 2,5 Ø	3,2 + 4 + 5 Ø	6,3 + 8 + 10 Ø	≤ 12,5 - 16 Ø
	- 0,006	- 0,008	- 0,009	- 0,011

Length: Total  $l_2+1$   
Step  $l_1 +0,5$

**Material:** HSS: High Speed Steel  
ASP30: Powder metallurgy manufactured High Speed Steel

**Material Properties:** HSS: For working high strength or difficult to work materials. Very abrasion proof high tensile strength and high heat resistance.  
ASP30: A noticeable increase in the life expectancy, e.g. when piercing stainless materials.

**Hardness:**

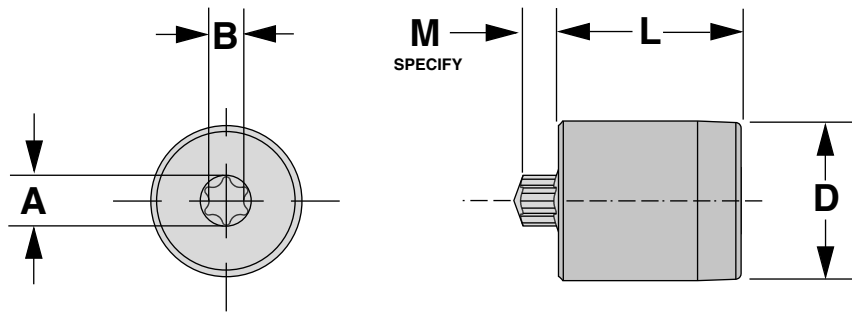
		<u>HSS</u>	<u>ASP 30</u>
Shaft:	HRC	62 - 64	65 - 67
Head:	HRC	45 - 55	48 - 55

**Finish:** Hardened, annealed, cylindrical head precision ground, subsequently the shaft is plunge cut ground over the whole length including the underneath part of the head surface ground.

**Note:** These piercing punches are designed for moving punch holding devices in the die. They are designed, contrary to piercing punches with conical head, for level coating areas at the punch holding plate. By allowing adequate tolerance clearance between piercing punch, punch holding plate and pressure plate, the bending stresses, which will occur due to misalignment in rigid installations, can therefore be avoided. The main measurements are based on standard figures and take into account a supporting flange at the head of the piercing punch, which will permit stripping of piercing particles or stripes without plasticised deforming of the punch holding plate.

# #1000 6-LOBE (TX) ONE PIECE PUNCH

TMP/TXP-15.1

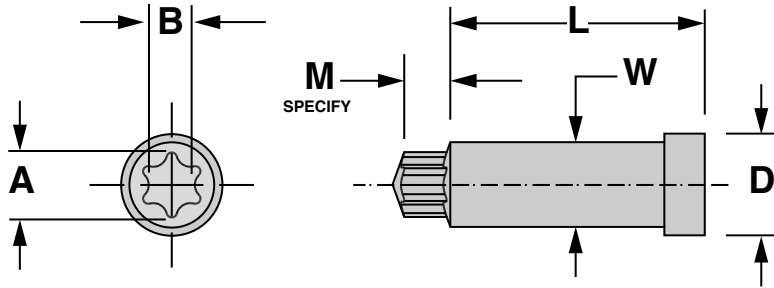


PART NUMBER	DRIVE SIZE	M REF. inch / mm	A inch / mm	B inch / mm	D inch / mm	L inch / mm
1000-01-275	1	.014 / 0,36	.035 / 0,90	.025 / 0,65	7/16 / 12.0	1.0 / 25,4
1000-02-275	2	.016 / 0,41	.039 / 1,01	.028 / 0,73	-	-
1000-03-275	3	.018 / 0,45	.047 / 1,21	.034 / 0,88	-	-
1000-04-275	4	.022 / 0,56	.054 / 1,37	.039 / 0,99	-	-
1000-05-009	5	.014 / 0,35	.059 / 1,49	.043 / 1,09	7/16 / 12.0	1.0 / 25,4
1000-05-017	5	.022 / 0,55	-	-	-	-
1000-05-025	5	.028 / 0,71	-	-	-	-
1000-06-015	6	.019 / 0,48	.070 / 1,77	.050 / 1,29	7/16 / 12.0	1.0 / 25,4
1000-06-022	6	.027 / 0,68	-	-	-	-
1000-06-030	6	.030 / 0,76	-	-	-	-
1000-06-035	6	.038 / 0,96	-	-	-	-
1000-07-015	7	.022 / 0,55	.082 / 2,09	.059 / 1,52	7/16 / 12.0	1.0 / 25,4
1000-07-020	7	.027 / 0,68	-	-	-	-
1000-07-025	7	.030 / 0,76	-	-	-	-
1000-07-027	7	.032 / 0,81	-	-	-	-
1000-07-030	7	.035 / 0,88	-	-	-	-
1000-07-035	7	.040 / 1,01	-	-	-	-
1000-08-018	8	.025 / 0,63	.095 / 2,41	.069 / 1,75	7/16 / 12.0	1.0 / 25,4
1000-08-020	8	.027 / 0,68	-	-	-	-
1000-08-025	8	.030 / 0,76	-	-	-	-
1000-08-028	8	.035 / 0,88	-	-	-	-
1000-08-030	8	.032 / 0,81	-	-	-	-
1000-08-033	8	.038 / 0,96	-	-	-	-
1000-08-040	8	.043 / 0,96	-	-	-	-
1000-08-043	8	.048 / 1,22	-	-	-	-
1000-09-029	9	.034 / 0,86	.102 / 2,59	.074 / 1,88	.7/16 / 12.0	1.0 / 25,4
1000-09-032	9	.037 / 0,93	-	-	-	-
1000-09-035	9	.043 / 1,09	-	-	-	-
1000-09-047	9	.052 / 1,32	-	-	-	-

MATERIAL: M-2 HSS RC 62-64  
MATERIAL: M-42 HSS RC 64-66  
COATINGS: AVAILABLE UPON REQUEST.

# #1100 6-LOBE (TX) PUNCH PINS

TMP/TXP-20,21

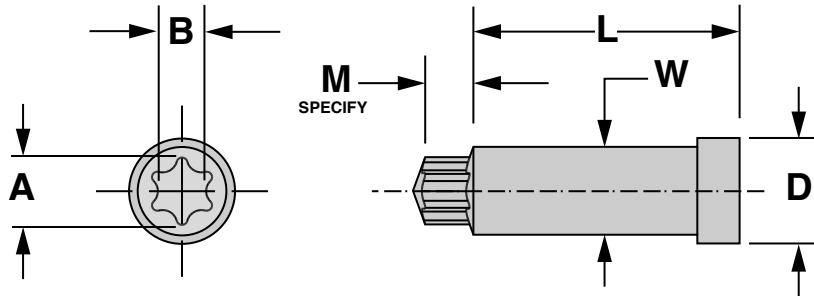


PART NUMBER	DRIVE SIZE	M REF. inch / mm	A inch / mm	B inch / mm	D inch / mm	L inch / mm	W inch / mm
1100-05-250	5	.031 / 0,78	.059 / 1,49	.043 / 1,09	.073 / 1,85	.375 / 9,52	.062 / 1,57
1100-05-251	5	.017 / 0,43	-	-	-	-	-
1100-05-252	5	.025 / 0,63	-	-	-	-	-
1100-06-250	6	.041 / 1,04	.070 / 1,77	.050 / 1,29	.086 / 2,18	.375 / 9,52	.074 / 1,87
1100-06-251	6	.022 / 0,55	-	-	-	-	-
1100-06-252	6	.030 / 0,76	-	-	-	-	-
1100-06-253	6	.033 / 0,83	-	-	-	-	-
1100-07-250	7	.033 / 0,83	.082 / 2,09	.059 / 1,52	.099 / 2,51	.375 / 9,52	.086 / 2,20
1100-07-251	7	.038 / 0,96	-	-	-	-	-
1100-07-252	7	.043 / 1,09	-	-	-	-	-
1100-07-253	7	.030 / 0,76	-	-	-	-	-
1100-07-254	7	.025 / 0,63	-	-	-	-	-
1100-07-255	7	.035 / 0,88	-	-	-	-	-
1100-08-250	8	.033 / 0,83	.095 / 2,41	.069 / 1,75	.111 / 2,81	.375 / 9,52	.099 / 2,51
1100-08-251	8	.041 / 1,04	-	-	-	-	-
1100-08-252	8	.051 / 1,29	-	-	-	-	-
1100-08-253	8	.038 / 0,96	-	-	-	-	-
1100-08-254	8	.030 / 0,76	-	-	-	-	-
1100-08-255	8	.028 / 0,71	-	-	-	-	-
1100-08-256	8	.043 / 1,09	-	-	-	-	-
1100-08-257	8	.035 / 0,88	-	-	-	-	-
1100-08-258	8	.041 / 1,04	-	-	-	-	-
1100-09-250	9	.040 / 1,01	.102 / 2,59	.074 / 1,87	.118 / 2,99	.375 / 9,52	.106 / 2,69
1100-09-251	9	.055 / 1,39	-	-	-	-	-
1100-09-252	9	.046 / 1,16	-	-	-	-	-
1100-09-253	9	.037 / 0,93	-	-	-	-	-
1100-10-250	10	.050 / 1,27	.111 / 2,81	.081 / 2,05	.128 / 3,27	.629 / 15,97	.115 / 2,92
1100-10-251	10	.040 / 1,01	-	-	-	-	-
1100-10-252	10	.060 / 1,52	-	-	-	-	-
1100-10-253	10	.035 / 0,88	-	-	-	-	-
1100-10-254	10	.045 / 1,14	-	-	-	-	-
1100-10-255	10	.030 / 0,76	-	-	-	-	-
1100-10-256	10	.033 / 0,83	-	-	-	-	-
1100-15-250	15	.060 / 1,52	.132 / 3,35	.096 / 2,43	.149 / 3,78	.629 / 15,97	.136 / 3,45
1100-15-251	15	.045 / 1,14	-	-	-	-	-
1100-15-252	15	.070 / 1,77	-	-	-	-	-
1100-15-253	15	.035 / 0,88	-	-	-	-	-
1100-15-254	15	.050 / 1,27	-	-	-	-	-
1100-15-255	15	.033 / 0,83	-	-	-	-	-
1100-15-256	15	.041 / 1,04	-	-	-	-	-
1100-20-250	20	.089 / 2,26	.155 / 3,93	.112 / 2,84	.183 / 4,67	.629 / 15,97	.159 / 4,03
1100-20-251	20	.065 / 1,65	-	-	-	-	-
1100-20-252	20	.080 / 2,03	-	-	-	-	-
1100-20-253	20	.050 / 1,27	-	-	-	-	-

MATERIAL: M-2 HSS RC 62-64  
 MATERIAL: M-42 HSS RC 64-66  
 COATINGS: AVAILABLE UPON REQUEST.

# #1100 6-LOBE (TX) PUNCH PINS

TMP/TXP-20,21



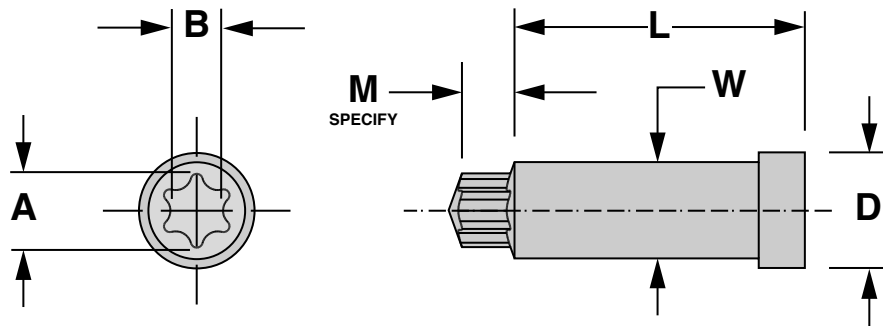
PART NUMBER	DRIVE SIZE	M REF. inch / mm	A inch / mm	B inch / mm	D inch / mm	L inch / mm	W inch / mm
1100-20-254	20	.038 / 0,96	.155 / 3,93	.112 / 2,84	.183 / 4,64	.629 / 15,97	.159 / 4,03
1100-20-255	20	.060 / 1,52	-	-	-	-	-
1100-20-256	20	.056 / 1,42	-	-	-	-	-
1100-20-257	20	.036 / 0,91	-	-	-	-	-
1100-20-258	20	.045 / 1,14	-	-	-	-	-
1100-25-250	25	.115 / 2,92	.178 / 4,52	.129 / 3,27	.204 / 5,18	.632 / 16,05	.182 / 4,62
1100-25-251	25	.065 / 1,65	-	-	-	-	-
1100-25-252	25	.090 / 2,28	-	-	-	-	-
1100-25-253	25	.055 / 1,39	-	-	-	-	-
1100-25-254	25	.075 / 1,90	-	-	-	-	-
1100-25-255	25	.044 / 1,11	-	-	-	-	-
1100-25-256	25	.060 / 1,52	-	-	-	-	-
1100-27-250	27	.120 / 3,04	.200 / 5,08	.144 / 3,65	.225 / 5,71	.632 / 16,05	.208 / 5,28
1100-27-251	27	.065 / 1,65	-	-	-	-	-
1100-27-252	27	.105 / 2,66	-	-	-	-	-
1100-27-253	27	.085 / 2,15	-	-	-	-	-
1100-27-254	27	.075 / 1,90	-	-	-	-	-
1100-27-255	27	.050 / 1,27	-	-	-	-	-
1100-27-258	27	.060 / 1,52	-	-	-	-	-
1100-27-259	27	.090 / 2,28	-	-	-	-	-
1100-30-250	30	.125 / 3,17	.221 / 5,61	.160 / 4,06	.254 / 6,45	.632 / 16,05	.225 / 5,71
1100-30-251	30	.090 / 2,28	-	-	-	-	-
1100-30-252	30	.105 / 2,66	-	-	-	-	-
1100-30-253	30	.070 / 1,77	-	-	-	-	-
1100-30-254	30	.055 / 1,39	-	-	-	-	-
1100-30-255	30	.043 / 1,09	-	-	-	-	-
1100-30-256	30	.080 / 2,03	-	-	-	-	-
1100-30-257	30	.075 / 1,90	-	-	-	-	-
1100-30-258	30	.060 / 1,52	-	-	-	-	-
1100-30-260	30	.065 / 1,65	-	-	-	-	-
1100-40-250	40	.135 / 3,42	.267 / 6,78	.192 / 4,87	.300 / 7,62	.760 / 19,30	.271 / 6,88
1100-40-251	40	.110 / 2,79	-	-	-	-	-
1100-40-252	40	.125 / 3,17	-	-	-	-	-
1100-40-253	40	.120 / 3,04	-	-	-	-	-
1100-40-254	40	.097 / 2,46	-	-	-	-	-
1100-40-255	40	.085 / 2,15	-	-	-	-	-
1100-40-256	40	.070 / 1,77	-	-	-	-	-
1100-40-257	40	.090 / 2,28	-	-	-	-	-
1100-40-260	40	.080 / 2,03	-	-	-	-	-
1100-45-250	45	.155 / 3,93	.313 / 7,95	.224 / 5,68	.374 / 9,49	1.010 / 25,65	.330 / 8,38
1100-45-251	45	.115 / 2,92	-	-	-	-	-
1100-45-252	45	.140 / 3,55	-	-	-	-	-
1100-45-253	45	.110 / 2,79	-	-	-	-	-
1100-45-254	45	.085 / 2,15	-	-	-	-	-
1100-45-256	45	.105 / 2,66	-	-	-	-	-

MATERIAL: M-2 HSS RC 62-64  
 MATERIAL: M-42 HSS RC 64-66  
 COATINGS: AVAILABLE UPON REQUEST.



# #1100 6-LOBE (TX) PUNCH PINS

TMP/XP-20,21

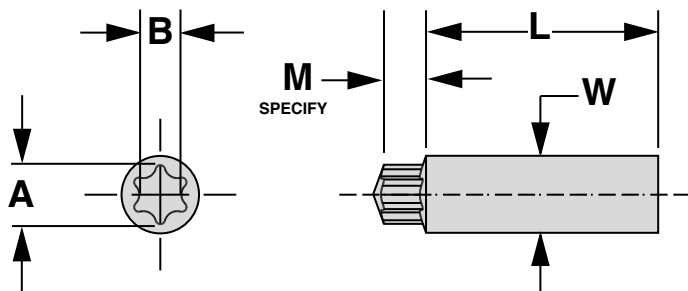


PART NUMBER	DRIVE SIZE	M REF. inch / mm	A inch / mm	B inch / mm	D inch / mm	L inch / mm	W inch / mm
1100-50-250	50	.154 / 3,91	.353 / 8,96	.256 / 6,50	.417 / 10,59	1.010 / 25,65	.374 / 9,49
1100-50-251	50	.135 / 3,42	-	-	-	-	-
1100-50-252	50	.160 / 4,06	-	-	-	-	-
1100-50-253	50	.095 / 2,41	-	-	-	-	-
1100-50-255	50	.176 / 4,47	-	-	-	-	-
1100-50-256	50	.129 / 3,27	-	-	-	-	-
1100-50-257	50	.110 / 2,79	-	-	-	-	-
1100-50-258	50	.143 / 3,63	-	-	-	-	-
1100-50-259	50	.120 / 3,04	-	-	-	-	-
1100-55-250	55	.215 / 5,46	.447 / 11,35	.318 / 8,07	.515 / 13,08	1.010 / 25,65	.469 / 11,91
1100-55-251	55	.110 / 2,79	-	-	-	-	-
1100-55-252	55	.200 / 5,08	-	-	-	-	-
1100-55-253	55	.145 / 3,68	-	-	-	-	-
1100-55-254	55	.175 / 4,44	-	-	-	-	-
1100-55-255	55	.095 / 2,41	-	-	-	-	-
1100-55-256	55	.155 / 3,93	-	-	-	-	-
1100-55-257	55	.135 / 3,42	-	-	-	-	-
1100-55-258	55	.115 / 2,92	-	-	-	-	-
1100-55-259	55	.190 / 4,82	-	-	-	-	-
1100-60-250	60	.280 / 7,11	.529 / 13,43	.381 / 9,67	.592 / 15,03	1.010 / 25,65	.562 / 14,27
1100-60-251	60	.145 / 3,68	-	-	-	-	-
1100-60-252	60	.245 / 6,22	-	-	-	-	-
1100-60-253	60	.215 / 5,46	-	-	-	-	-
1100-60-254	60	.185 / 4,69	-	-	-	-	-
1100-60-256	60	.150 / 3,81	-	-	-	-	-
1100-60-257	60	.221 / 5,61	-	-	-	-	-
1100-70-250	70	.320 / 8,12	.619 / 15,72	.443 / 11,25	.682 / 17,32	1.510 / 38,35	.652 / 16,56
1100-70-251	70	.240 / 6,09	-	-	-	-	-
1100-70-252	70	.280 / 7,11	-	-	-	-	-
1100-70-255	70	.174 / 4,41	-	-	-	-	-
1100-70-256	70	.261 / 6,62	-	-	-	-	-
1100-80-250	80	.370 / 9,39	.700 / 17,78	.508 / 12,90	.762 / 19,35	1.510 / 38,35	.733 / 18,61
1100-80-251	80	.315 / 8,00	-	-	-	-	-
1100-80-254	80	.202 / 5,13	-	-	-	-	-
1100-80-255	80	.300 / 7,62	-	-	-	-	-
1100-90-250	90	.380 / 9,65	.796 / 20,21	.569 / 14,45	.860 / 21,84	1.510 / 38,35	.829 / 21,05
1100-90-251	90	.300 / 7,62	-	-	-	-	-
1100-90-252	90	.360 / 9,14	-	-	-	-	-
1100-90-253	90	.240 / 6,09	-	-	-	-	-
1100-90-255	90	.221 / 5,61	-	-	-	-	-
1100-90-256	90	.347 / 8,81	-	-	-	-	-
1100-100-250	100	.400 / 10,16	.883 / 22,42	.632 / 16,05	.948 / 24,07	1.516 / 38,50	.916 / 23,26
1100-100-251	100	.450 / 11,43	-	-	-	-	-
1100-100-252	100	.510 / 12,95	-	-	-	-	-

MATERIAL: M-2 HSS RC 62-64  
MATERIAL: M-42 HSS RC 64-66  
COATINGS: AVAILABLE UPON REQUEST.

# #1101 6-LOBE (TX) PUNCH PINS

TMP/TXP-20

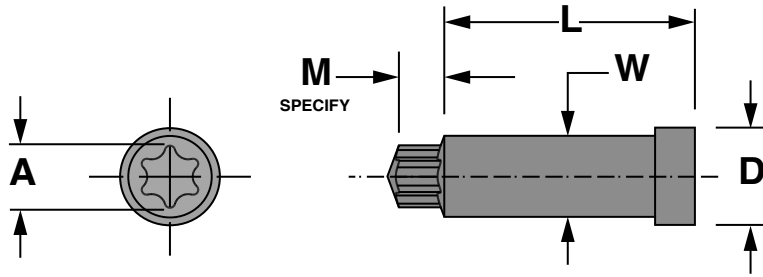


PART NUMBER	DRIVE SIZE	M REF. inch / mm	A inch / mm	B inch / mm	L inch / mm	W inch / mm
1101-01-275	1	.014 / 0,36	.035 / 0,90	.025 / 0,65	.379 / 9,63	.038 / 0,98
1101-02-275	2	.016 / 0,41	.039 / 1,01	.028 / 0,73	-	.042 / 1,07
1101-03-275	3	.018 / 0,45	.047 / 1,21	.034 / 0,88	-	.051 / 1,32
1101-04-275	4	.022 / 0,56	.054 / 1,37	.039 / 0,99	-	.057 / 1,45
1101-05-009	5	.014 / 0,35	.059 / 1,49	.043 / 1,09	.379 / 9,63	.074 / 1,88
1101-05-017	5	.022 / 0,55	-	-	-	-
1101-05-025	5	.028 / 0,71	-	-	-	-
1101-06-015	6	.019 / 0,48	.070 / 1,77	.050 / 1,29	.379 / 9,63	.090 / 2,29
1101-06-022	6	.027 / 0,68	-	-	-	-
1101-06-030	6	.030 / 0,76	-	-	-	-
1101-06-035	6	.038 / 0,96	-	-	-	-
1101-07-015	7	.022 / 0,55	.082 / 2,09	.059 / 1,52	.379 / 9,63	.102 / 2,59
1101-07-020	7	.027 / 0,68	-	-	-	-
1101-07-025	7	.030 / 0,76	-	-	-	-
1101-07-027	7	.032 / 0,81	-	-	-	-
1101-07-030	7	.035 / 0,88	-	-	-	-
1101-07-035	7	.040 / 1,01	-	-	-	-
1101-08-018	8	.025 / 0,63	.095 / 2,41	.069 / 1,75	.629 / 15,98	.110 / 2,79
1101-08-020	8	.027 / 0,68	-	-	-	-
1101-08-025	8	.030 / 0,76	-	-	-	-
1101-08-028	8	.035 / 0,88	-	-	-	-
1101-08-030	8	.032 / 0,81	-	-	-	-
1101-08-033	8	.038 / 0,96	-	-	-	-
1101-08-040	8	.043 / 0,96	-	-	-	-
1101-08-043	8	.048 / 1,22	-	-	-	-
1101-09-029	9	.034 / 0,86	.102 / 2,59	.074 / 1,88	.629 / 15,98	.117 / 2,97
1101-09-032	9	.037 / 0,93	-	-	-	-
1101-09-035	9	.043 / 1,09	-	-	-	-
1101-09-047	9	.052 / 1,32	-	-	-	-

MATERIAL: M-2 HSS RC 62-64  
MATERIAL: M-42 HSS RC 64-66  
COATINGS: AVAILABLE UPON REQUEST.

# #1102 6-LOBE (TX) CARBIDE PUNCH PINS

TMP/TXP-20,21

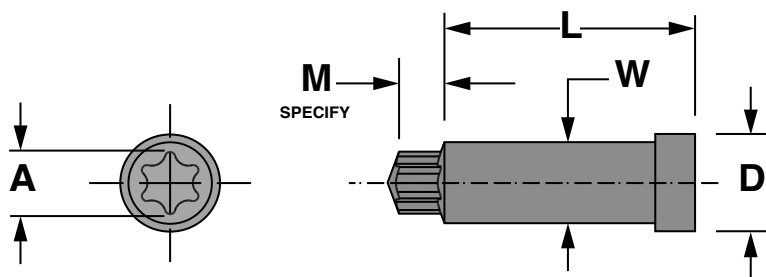


PART NUMBER	DRIVE SIZE	M REF. inch / mm	A inch / mm	B inch / mm	D inch / mm	L inch / mm	W inch / mm
1102-10-250	10	.050 / 1,27	1.11 / 2,81	.081 / 2,05	.128 / 3,27	.629 / 15,97	.115 / 2,92
1102-10-251	10	.040 / 1,01	-	-	-	-	-
1102-10-252	10	.060 / 1,77	-	-	-	-	-
1102-10-253	10	.035 / 0,88	-	-	-	-	-
1102-10-254	10	.045 / 1,14	-	-	-	-	-
1102-10-255	10	.030 / 0,76	-	-	-	-	-
1102-10-256	10	.033 / 1,83	-	-	-	-	-
1102-15-250	15	.060 / 1,52	.132 / 3,35	.096 / 2,43	.149 / 3,78	.629 / 15,97	.136 / 3,45
1102-15-251	15	.045 / 1,14	-	-	-	-	-
1102-15-252	15	.070 / 1,77	-	-	-	-	-
1102-15-253	15	.035 / 0,88	-	-	-	-	-
1102-15-254	15	.050 / 1,27	-	-	-	-	-
1102-15-255	15	.033 / 0,83	-	-	-	-	-
1102-15-256	15	.041 / 1,04	-	-	-	-	-
1102-20-250	20	.089 / 2,26	.155 / 3,93	.112 / 2,84	.183 / 4,64	.629 / 15,97	.159 / 4,03
1102-20-251	20	.065 / 1,65	-	-	-	-	-
1102-20-252	20	.080 / 2,03	-	-	-	-	-
1102-20-253	20	.050 / 1,27	-	-	-	-	-
1102-20-254	20	.038 / 0,96	-	-	-	-	-
1102-20-255	20	.060 / 1,52	-	-	-	-	-
1102-20-256	20	.056 / 1,42	-	-	-	-	-
1102-20-257	20	.036 / 0,91	-	-	-	-	-
1102-20-258	20	.045 / 1,14	-	-	-	-	-
1102-25-250	25	.115 / 2,92	.178 / 4,52	.129 / 3,27	.204 / 5,18	.632 / 16,05	.182 / 4,62
1102-25-251	25	.065 / 1,65	-	-	-	-	-
1102-25-252	25	.090 / 2,28	-	-	-	-	-
1102-25-253	25	.055 / 1,39	-	-	-	-	-
1102-25-254	25	.075 / 1,90	-	-	-	-	-
1102-25-255	25	.044 / 1,11	-	-	-	-	-
1102-25-256	25	.060 / 1,52	-	-	-	-	-
1102-27-250	27	.120 / 3,04	.200 / 5,08	.144 / 3,65	.225 / 5,71	.632 / 16,05	.208 / 5,28
1102-27-251	27	.065 / 1,65	-	-	-	-	-
1102-27-252	27	.105 / 2,66	-	-	-	-	-
1102-27-253	27	.085 / 2,15	-	-	-	-	-
1102-27-254	27	.075 / 1,90	-	-	-	-	-
1102-27-255	27	.050 / 1,27	-	-	-	-	-
1102-27-258	27	.060 / 1,52	-	-	-	-	-
1102-27-259	27	.090 / 2,28	-	-	-	-	-
1102-30-250	30	.125 / 3,17	.221 / 5,61	.160 / 4,06	.254 / 6,45	.632 / 16,05	.225 / 5,71
1102-30-251	30	.090 / 2,28	-	-	-	-	-
1102-30-252	30	.105 / 2,66	-	-	-	-	-
1102-30-253	30	.070 / 1,77	-	-	-	-	-
1102-30-254	30	.055 / 1,39	-	-	-	-	-
1102-30-255	30	.043 / 1,09	-	-	-	-	-
1102-30-256	30	.080 / 2,03	-	-	-	-	-
1102-30-257	30	.075 / 1,90	-	-	-	-	-
1102-30-258	30	.060 / 1,52	-	-	-	-	-
1102-30-260	30	.065 / 1,65	-	-	-	-	-

MATERIAL: CARBIDE  
COATINGS: PVD OR CVD AVAILABLE UPON REQUEST.

# #1102 6-LOBE (TX) CARBIDE PUNCH PINS

TMP/TXP-20,21

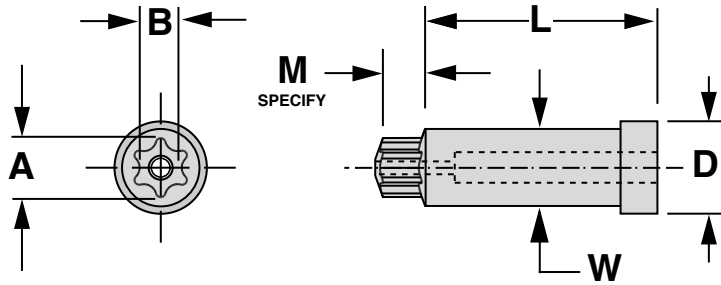


PART NUMBER	DRIVE SIZE	M REF. inch / mm	A inch / mm	B inch / mm	D inch / mm	L inch / mm	W inch / mm
1102-40-250	40	.135 / 3,42	.267 / 6,78	.192 / 4,87	.300 / 7,62	.760 / 19,30	.271 / 6,88
1102-40-251	40	.110 / 2,79	-	-	-	-	-
1102-40-252	40	.125 / 3,17	-	-	-	-	-
1102-40-253	40	.120 / 3,04	-	-	-	-	-
1102-40-254	40	.097 / 2,46	-	-	-	-	-
1102-40-255	40	.085 / 2,15	-	-	-	-	-
1102-40-256	40	.070 / 1,77	-	-	-	-	-
1102-40-257	40	.090 / 2,28	-	-	-	-	-
1102-40-260	40	.080 / 2,03	-	-	-	-	-
1102-45-250	45	.155 / 3,93	.313 / 7,95	.224 / 5,68	.374 / 9,49	1.010 / 25,65	.330 / 8,38
1102-45-251	45	.115 / 2,92	-	-	-	-	-
1102-45-252	45	.140 / 3,55	-	-	-	-	-
1102-45-253	45	.110 / 2,79	-	-	-	-	-
1102-45-254	45	.085 / 2,15	-	-	-	-	-
1102-45-256	45	.105 / 2,66	-	-	-	-	-
1102-50-250	50	.154 / 3,91	.353 / 8,96	.256 / 6,50	.417 / 10,59	1.010 / 25,65	.374 / 9,49
1102-50-251	50	.135 / 3,42	-	-	-	-	-
1102-50-252	50	.160 / 4,06	-	-	-	-	-
1102-50-253	50	.095 / 2,41	-	-	-	-	-
1102-50-255	50	.176 / 4,47	-	-	-	-	-
1102-50-256	50	.129 / 3,27	-	-	-	-	-
1102-50-257	50	.110 / 2,79	-	-	-	-	-
1102-50-258	50	.143 / 3,63	-	-	-	-	-
1102-50-259	50	.120 / 3,04	-	-	-	-	-
1102-55-250	55	.215 / 5,46	.447 / 11,35	.318 / 8,07	.515 / 13,08	1.010 / 25,65	.469 / 11,91
1102-55-251	55	.110 / 2,79	-	-	-	-	-
1102-55-252	55	.200 / 5,08	-	-	-	-	-
1102-55-253	55	.145 / 3,68	-	-	-	-	-
1102-55-254	55	.175 / 4,44	-	-	-	-	-
1102-55-255	55	.095 / 2,41	-	-	-	-	-
1102-55-256	55	.155 / 3,93	-	-	-	-	-
1102-55-257	55	.135 / 3,42	-	-	-	-	-
1102-55-258	55	.115 / 2,92	-	-	-	-	-
1102-55-259	55	.190 / 4,82	-	-	-	-	-
1102-60-250	60	.280 / 7,11	.529 / 13,43	.381 / 9,67	.592 / 15,03	1.010 / 25,65	.562 / 14,27
1102-60-251	60	.145 / 3,68	-	-	-	-	-
1102-60-252	60	.245 / 6,22	-	-	-	-	-
1102-60-253	60	.215 / 5,46	-	-	-	-	-
1102-60-254	60	.185 / 4,69	-	-	-	-	-
1102-60-256	60	.150 / 3,81	-	-	-	-	-
1102-60-257	60	.221 / 5,61	-	-	-	-	-

MATERIAL: CARBIDE  
COATINGS: PVD OR CVD AVAILABLE UPON REQUEST.

# #1103 TAMPER-RESISTANT PUNCH PINS

TMP/TXP-19

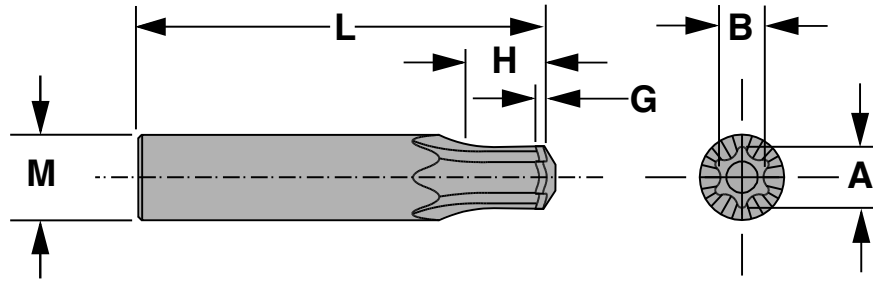


PART NUMBER	DRIVE SIZE	M REF. inch / mm	A inch / mm	B inch / mm	D inch / mm	L inch / mm	W inch / mm
1103-08-257	8	.035 / 0.88	.095 / 2.41	.069 / 1.75	.111 / 2.81	.375 / 9.520	.099 / 2.51
1103-10-250	10	.050 / 1.27	.111 / 2.81	.081 / 2.05	.128 / 3.27	.629 / 15.97	.115 / 2.92
1103-10-251	10	.040 / 1.01	.111 / 2.81	.081 / 2.05	.128 / 3.27	.629 / 15.97	.115 / 2.92
1103-15-251	15	.045 / 1.14	.132 / 3.35	.096 / 2.43	.149 / 3.78	.629 / 15.97	.136 / 3.45
1103-15-253	15	.035 / 0.88	.132 / 3.35	.096 / 2.43	.149 / 3.78	.629 / 15.97	.136 / 3.45
1103-15-254	15	.050 / 1.27	.132 / 3.35	.096 / 2.43	.149 / 3.78	.629 / 15.97	.136 / 3.45
1103-20-253	20	.050 / 1.27	.155 / 3.93	.112 / 2.84	.183 / 4.64	.629 / 15.97	.159 / 4.03
1103-20-254	20	.038 / 0.96	.155 / 3.93	.112 / 2.84	.183 / 4.64	.629 / 15.97	.159 / 4.03
1103-20-256	20	.056 / 1.42	.155 / 3.93	.112 / 2.84	.183 / 4.64	.629 / 15.97	.159 / 4.03
1103-25-253	25	.055 / 1.39	.178 / 4.52	.129 / 3.27	.204 / 5.18	.632 / 16.05	.182 / 4.62
1103-25-254	25	.075 / 1.90	.178 / 4.52	.129 / 3.27	.204 / 5.18	.632 / 16.05	.182 / 4.62
1103-27-251	27	.065 / 1.65	.200 / 5.08	.144 / 3.65	.225 / 5.71	.632 / 16.05	.208 / 5.28
1103-27-254	27	.075 / 1.90	.200 / 5.08	.144 / 3.65	.225 / 5.71	.632 / 16.05	.208 / 5.28
1103-30-253	30	.070 / 1.77	.221 / 5.61	.160 / 4.06	.254 / 6.45	.632 / 16.05	.225 / 5.71
1103-40-251	40	.110 / 2.79	.267 / 6.78	.192 / 4.87	.300 / 7.62	.760 / 19.30	.271 / 6.88
1103-40-254	40	.097 / 2.46	.267 / 6.78	.192 / 4.87	.300 / 7.62	.760 / 19.30	.271 / 6.88
1103-45-253	45	.110 / 2.79	.313 / 7.95	.224 / 5.68	.374 / 9.49	1.010 / 25.65	.330 / 8.38
1103-45-254	45	.085 / 2.15	.313 / 7.95	.224 / 5.68	.374 / 9.49	1.010 / 25.65	.330 / 8.38
1103-50-257	50	.110 / 2.79	.353 / 8.96	.256 / 6.50	.417 / 10.59	1.010 / 25.65	.374 / 9.49
1103-55-253	55	.145 / 3.68	.447 / 11.35	.318 / 8.07	.515 / 13.08	1.010 / 25.65	.469 / 11.91
1103-60-254	60	.185 / 4.69	.529 / 13.43	.381 / 9.67	.592 / 15.03	1.010 / 25.65	.562 / 14.27

MATERIAL: M-2 HSS RC 62-64  
MATERIAL: M-42 HSS RC 64-66  
COATINGS: AVAILABLE UPON REQUEST.

# #1104 MULTI-STATION PUNCHES WITH LAND

TMP/XP-43



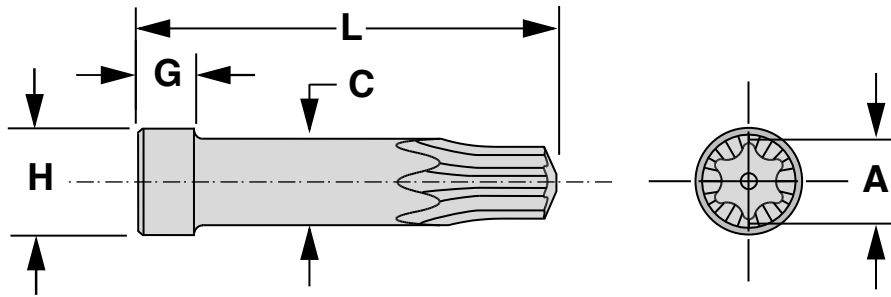
PART NUMBER	DRIVE SIZE	A inch / mm	B inch / mm	G inch / mm	H inch / mm	L inch / mm	M inch / mm
1104-05	5	.059 / 1.49	.043 / 1.09	.015 / 0.38	.090 / 2.28	1.00 / 25.40	.063 / 1.60
1104-06	6	.070 / 1.77	.050 / 1.27	.015 / 0.38	.105 / 2.66	1.00 / 25.40	.079 / 2.00
1104-07	7	.082 / 2.08	.059 / 1.49	.015 / 0.38	.125 / 3.17	1.00 / 25.40	.087 / 2.20
1104-08	8	.095 / 2.41	.069 / 1.75	.015 / 0.38	.145 / 3.68	1.00 / 25.40	.099 / 2.51
1104-09	9	.102 / 2.59	.074 / 1.87	.015 / 0.38	.155 / 3.93	1.00 / 25.40	.107 / 2.71
1104-10	10	.112 / 2.84	.081 / 2.05	.015 / 0.38	.170 / 4.31	1.00 / 25.40	.115 / 2.92
1104-15	15	.133 / 3.37	.096 / 2.43	.015 / 0.38	.200 / 5.08	1.26 / 32.00	.138 / 3.50
1104-20	20	.156 / 3.96	.112 / 2.84	.020 / 0.50	.235 / 5.96	1.26 / 32.00	.158 / 4.01
1104-25	25	.179 / 4.54	.129 / 3.27	.020 / 0.50	.270 / 6.85	1.26 / 32.00	.182 / 4.62
1104-27	27	.201 / 5.10	.144 / 3.65	.020 / 0.50	.300 / 7.62	1.26 / 32.00	.205 / 5.20
1104-30	30	.222 / 5.63	.160 / 4.06	.020 / 0.50	.340 / 8.63	1.26 / 32.00	.225 / 5.71
1104-40	40	.268 / 6.80	.192 / 4.87	.020 / 0.50	.405 / 10.28	1.51 / 38.35	.272 / 6.90
1104-45	45	.314 / 7.97	.224 / 5.68	.020 / 0.50	.475 / 12.06	1.51 / 38.35	.319 / 8.10
1104-50	50	.354 / 8.99	.256 / 6.50	.020 / 0.50	.530 / 13.46	1.51 / 38.35	.359 / 9.11
1104-55	55	.449 / 11.40	.318 / 8.07	.020 / 0.50	.675 / 17.14	1.51 / 38.35	.455 / 11.55
1104-60	60	.531 / 13.48	.381 / 9.67	.020 / 0.50	.800 / 20.32	2.19 / 55.62	.536 / 13.61
1104-70	70	.621 / 15.77	.443 / 11.25	.020 / 0.50	.930 / 23.62	2.19 / 55.62	.631 / 16.02
1104-80	80	.700 / 17.78	.508 / 12.90	.020 / 0.50	1.100 / 27.94	2.19 / 55.62	.749 / 19.02
1104-90	90	.798 / 20.26	.569 / 14.45	.020 / 0.50	1.200 / 30.48	2.19 / 55.62	.806 / 20.47
1104-100	100	.885 / 22.47	.632 / 16.05	.020 / 0.50	1.330 / 33.78	2.19 / 55.62	.906 / 23.01

MATERIAL: ASP-30 SUPER HIGH SPEED STEEL  
 HARDNESS: RC 64-66  
 COATINGS: AVAILABLE UPON REQUEST.



# #1105 6-LOBE PUNCHES

# MULTI-STATION PUNCH

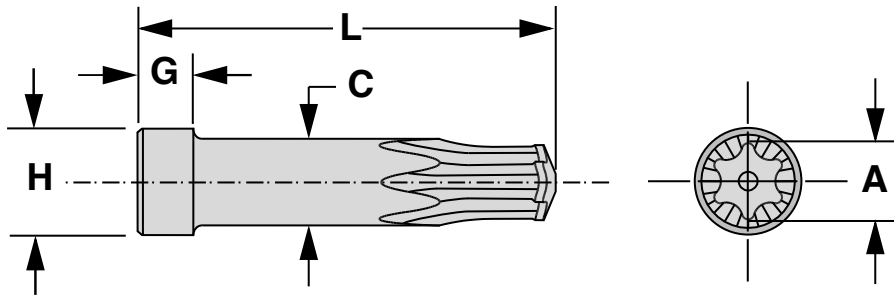


PART NUMBER	DRIVE SIZE	A inch / mm	C inch / mm	G inch / mm	H inch / mm	L inch / mm
1105-05	5	.059 / 1.49	.078 / 2,00	.118 / 3,0	.138 / 3,5	.86 / 22,0
1105-06	6	.070 / 1.77	.078 / 2,00	.118 / 3,0	.138 / 3,5	.86 / 22,0
1105-07	7	.082 / 2.08	.098 / 2,50	.138 / 3,5	.157 / 4,0	.98 / 25,0
1105-08	8	.095 / 2.41	.098 / 2,50	.138 / 3,5	.157 / 4,0	.98 / 25,0
1105-09	9	.102 / 2.59	.118 / 3,00	.157 / 4,0	.177 / 4,5	1.18 / 30,0
1105-10	10	.112 / 2.84	.118 / 3,00	.157 / 4,0	.177 / 4,5	1.18 / 30,0
1105-15	15	.133 / 3.37	.157 / 4,00	.157 / 4,0	.216 / 5,5	1.18 / 30,0
1105-20	20	.156 / 3.96	.157 / 4,00	.157 / 4,0	.216 / 5,5	1.18 / 30,0
1105-25	25	.179 / 4.54	.202 / 5,15	.197 / 5,0	.260 / 6,5	1.30 / 33,0
1105-27	27	.201 / 5.10	.202 / 5,15	.197 / 5,0	.260 / 6,5	1.30 / 33,0
1105-30	30	.222 / 5.63	.250 / 6,35	.197 / 5,0	.315 / 8,0	1.41 / 36,0
1105-40	40	.268 / 6.80	.295 / 7,50	.197 / 5,0	.354 / 9,0	1.41 / 36,0
1105-45	45	.314 / 7.97	.387 / 9,85	.236 / 6,0	.452 / 11,5	1.57 / 40,0
1105-50	50	.354 / 8.99	.387 / 9,85	.236 / 6,0	.452 / 11,5	1.57 / 40,0
1105-55	55	.449 / 11.40	.478 / 12,14	.236 / 6,0	.551 / 14,0	1.81 / 50,0
1105-60	60	.531 / 13.48	.570 / 14,50	.314 / 8,0	.630 / 16,0	2.16 / 60,0
1105-70	70	.621 / 15.77	.570 / 17,00	.314 / 8,0	.708 / 18,0	2.76 / 70,0
1105-80	80	.700 / 17.78	.748 / 19,00	.314 / 8,0	.807 / 20,5	2.76 / 70,0
1105-90	90	.798 / 20.26	.826 / 21,00	.393 / 10,0	.925 / 23,5	3.15 / 80,0
1105-100	100	.885 / 22.47	.925 / 23,50	.393 / 10,0	.984 / 25,0	3.15 / 80,0

MATERIAL: ASP-30 SUPER HIGH SPEED STEEL  
HARDNESS: RC 64-66  
COATINGS: AVAILABLE UPON REQUEST.

# #1105XP 6-LOBE PUNCHES

## MULTI-STATION PUNCH

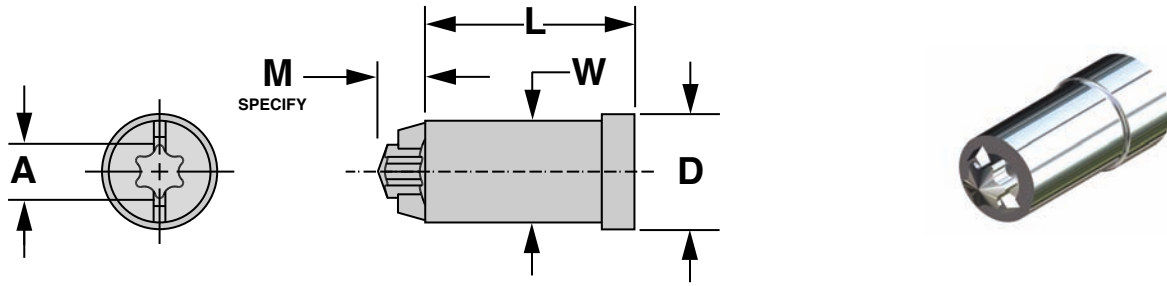


PART NUMBER	DRIVE SIZE	A inch / mm	C inch / mm	G inch / mm	H inch / mm	L inch / mm
1105XP-05	5	.059 / 1.49	.078 / 2,00	.118 / 3,0	.138 / 3,5	.86 / 22,0
1105XP-06	6	.070 / 1.77	.078 / 2,00	.118 / 3,0	.138 / 3,5	.86 / 22,0
1105XP-07	7	.082 / 2.08	.098 / 2,50	.138 / 3,5	.157 / 4,0	.98 / 25,0
1105XP-08	8	.095 / 2.41	.098 / 2,50	.138 / 3,5	.157 / 4,0	.98 / 25,0
1105XP-09	9	.102 / 2.59	.118 / 3,00	.157 / 4,0	.177 / 4,5	1.18 / 30,0
1105XP-10	10	.112 / 2.84	.118 / 3,00	.157 / 4,0	.177 / 4,5	1.18 / 30,0
1105XP-15	15	.133 / 3.37	.157 / 4,00	.157 / 4,0	.216 / 5,5	1.18 / 30,0
1105XP-20	20	.156 / 3.96	.157 / 4,00	.157 / 4,0	.216 / 5,5	1.18 / 30,0
1105XP-25	25	.179 / 4.54	.216 / 5,50	.197 / 5,0	.260 / 6,5	1.30 / 33,0
1105XP-27	27	.201 / 5.10	.216 / 5,50	.197 / 5,0	.260 / 6,5	1.30 / 33,0
1105XP-30	30	.222 / 5.63	.255 / 6,50	.197 / 5,0	.315 / 8,0	1.41 / 36,0
1105XP-40	40	.268 / 6.80	.295 / 7,50	.197 / 5,0	.354 / 9,0	1.41 / 36,0
1105XP-45	45	.314 / 7.97	.387 / 10,00	.236 / 6,0	.452 / 11,5	1.57 / 40,0
1105XP-50	50	.354 / 8.99	.387 / 10,00	.236 / 6,0	.452 / 11,5	1.57 / 40,0
1105XP-55	55	.449 / 11.40	.472 / 12,50	.236 / 6,0	.551 / 14,0	1.81 / 50,0
1105XP-60	60	.531 / 13.48	.570 / 14,50	.314 / 8,0	.630 / 16,0	2.16 / 60,0
1105XP-70	70	.621 / 15.77	.688 / 17,50	.314 / 8,0	.708 / 18,0	2.76 / 70,0
1105XP-80	80	.700 / 17.78	.748 / 19,00	.314 / 8,0	.846 / 21,5	2.76 / 70,0
1105XP-90	90	.798 / 20.26	.826 / 21,00	.393 / 10,0	.925 / 23,5	3.15 / 80,0
1105XP-100	100	.885 / 22.47	.925 / 23,50	.393 / 10,0	.984 / 25,0	3.15 / 80,0

MATERIAL: ASP-30 SUPER HIGH SPEED STEEL  
HARDNESS: RC 64-66  
COATINGS: AVAILABLE UPON REQUEST.

# #1106 6-LOBE (TX) STRUCK SLOT PUNCH PINS

TMP-49A

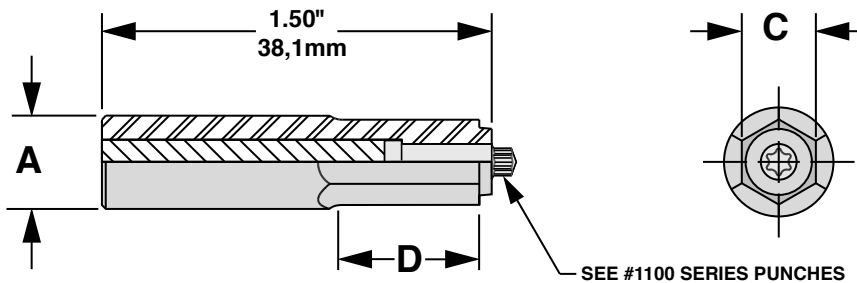


PART NUMBER	DRIVE SIZE	M REF. inch / mm	A inch / mm	L inch / mm	D inch / mm	W inch / mm
1106-07-170	7	.030 / 0,76	.082 / 2,08	.629 / 15,97	.176 / 4,49	.160 / 4,06
1106-08-170	8	.040 / 1,01	.095 / 2,40	.629 / 15,97	.176 / 4,49	.160 / 4,06
1106-09-170	9	.040 / 1,01	.102 / 2,59	.629 / 15,97	.176 / 4,49	.160 / 4,06
1106-10-170	10	.045 / 1,14	.111 / 2,81	.629 / 15,97	.197 / 5,00	.179 / 4,57
1106-15-170	15	.050 / 1,27	.132 / 3,35	.629 / 15,97	.217 / 5,51	.200 / 5,08
1106-20-170	20	.060 / 1,52	.155 / 3,93	.629 / 15,97	.252 / 6,40	.225 / 5,71
1106-25-170	25	.075 / 1,90	.178 / 4,53	.632 / 16,05	.297 / 7,54	.269 / 6,85
1106-27-170	27	.080 / 2,03	.200 / 5,09	.632 / 16,05	.347 / 8,81	.320 / 8,12
1106-30-170	30	.095 / 2,41	.221 / 5,62	.632 / 16,05	.397 / 10,08	.370 / 9,39
1106-40-170	40	.110 / 2,79	.267 / 6,78	.760 / 19,30	.497 / 12,62	.450 / 11,43
1106-45-170	45	.140 / 3,55	.313 / 7,96	1.010 / 25,65	.567 / 14,40	.510 / 12,95
1106-50-170	50	.154 / 3,91	.353 / 8,97	1.010 / 25,65	.657 / 16,68	.610 / 15,49
1106-55-170	55	.175 / 4,44	.447 / 11,36	1.010 / 25,65	.797 / 20,24	.750 / 19,05

MATERIAL: M-2 HSS RC 62-64  
MATERIAL: M-42 HSS RC 64-66

# #1107 6-LOBE (TX) INDENTED HEX PIN HOLDER

TMP-34



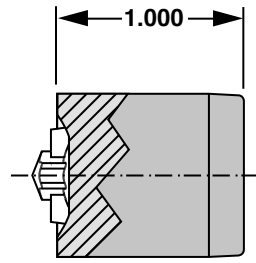
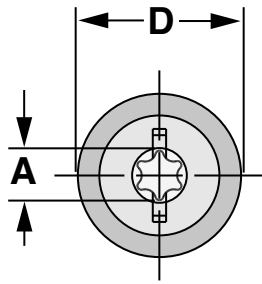
SEE #1100 SERIES PUNCHES

PART NUMBER	DRIVE SIZE	SCREW SIZE	A inch / mm	C inch / mm	D inch / mm	USE 6-LOBE™ PUNCH NO.
1107-10	10	#5	.307 / 7,80	.179 / 4,55	.687 / 17,44	1100-10-045
1107-15	15	#6	.307 / 7,80	.242 / 6,15	.687 / 17,44	1100-15-050
1107-20	20	#8	.307 / 7,80	.242 / 6,15	.687 / 17,44	1100-20-060
1107-25	25	#10	.372 / 9,45	.302 / 7,67	.687 / 17,44	1100-25-065
1107-27	27	#12	.371 / 9,45	.302 / 7,67	.687 / 17,44	1100-27-075
1107-30	30	1/4"	.494 / 12,54	.364 / 9,25	1.250 / 31,75	1100-30-090
1107-40	40	5/16"	.619 / 15,72	.487 / 12,34	1.250 / 31,75	1100-40-112
1107-45	45	3/8"	.619 / 15,72	.548 / 13,92	1.250 / 31,75	1100-45-140

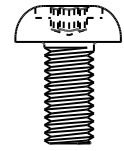
MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 62-64  
COATINGS: AVAILABLE UPON REQUEST.

# #1108 6-LOBE (TX) STRUCK SLOT PUNCHES

TXP-33.4



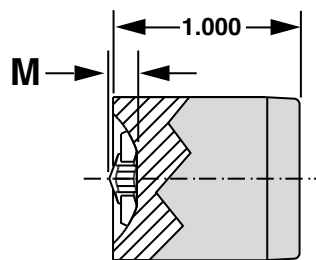
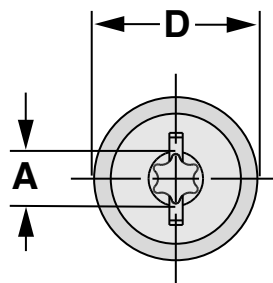
STRUCK SLOT PAN  
HEAD SCREW



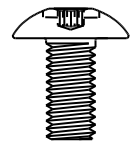
PART NUMBER	PUNCH REFERENCE	DRIVE SIZE	M REF. inch / mm	A inch / mm	D inch / mm
1108-07-175	7-TXI-175	7	.031 / 0,78	.081 / 2,07	.437 / 11,11
1108-08-175	8-TXI-175	8	.041 / 1,04	.094 / 2,39	.437 / 11,11
1108-08-176	8-TXI-176	8	.041 / 1,04	.094 / 2,39	.437 / 11,11
1108-09-175	9-TXI-175	9	.040 / 1,01	.101 / 2,57	.437 / 11,11
1108-10-176	10-TXI-175	10	.051 / 1,29	.111 / 2,81	.562 / 14,27
1108-10-175	10-TXI-176	10	.051 / 1,29	.111 / 2,81	.562 / 14,27
1108-15-175	15-TXI-175	15	.051 / 1,29	.132 / 3,35	.562 / 14,27
1108-20-175	20-TXI-175	20	.060 / 1,52	.155 / 3,93	.562 / 14,27
1108-25-175	25-TXI-175	25	.075 / 1,90	.178 / 4,53	.875 / 22,22
1108-27-175	27-TXI-175	27	.075 / 1,90	.200 / 5,09	.875 / 22,22
1108-30-175	30-TXI-175	30	.090 / 2,28	.221 / 5,62	.875 / 22,22
1108-40-175	40-TXI-175	40	.110 / 2,79	.266 / 6,76	.875 / 22,22
1108-45-175	45-TXI-175	45	.140 / 3,55	.312 / 7,93	1.000 / 25,40

MATERIAL: M-2 HSS RC 62-64  
MATERIAL: M-42 HSS RC 64-66  
COATINGS: AVAILABLE UPON REQUEST

# #1109 6-LOBE (TX) COMBINATION PUNCHES

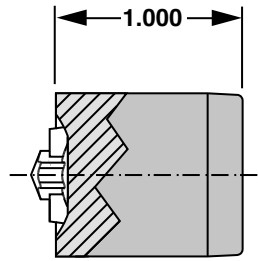
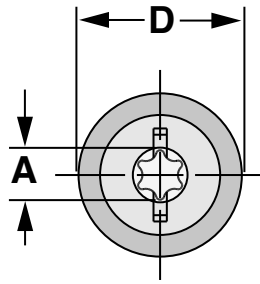


STRUCK SLOT TRUSS  
HEAD SCREW

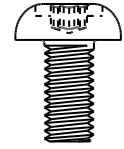


PART NUMBER	DRIVE SIZE	SCREW SIZE	M REF. inch / mm	A inch / mm	D inch / mm
1109-10	10	#6	.057 / 1,44	.110 / 2,79	.562 / 14,27
1109-15	15	#8	.061 / 1,54	.132 / 3,35	.562 / 14,27
1109-20	20	#10	.071 / 1,80	.155 / 3,93	.875 / 22,22
1109-25	25	#12	.083 / 2,10	.178 / 4,52	.875 / 22,22
1109-27	27	1/4"	.089 / 2,26	.200 / 5,08	.875 / 22,22
1109-30	30	1/4"	.091 / 2,31	.222 / 5,63	.875 / 22,22
1109-40	40	5/16"	.100 / 2,54	.266 / 6,75	.875 / 22,22

MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 62-64  
COATINGS: AVAILABLE UPON REQUEST



STRUCK SLOT PAN  
HEAD SCREW

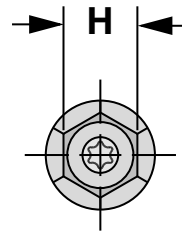
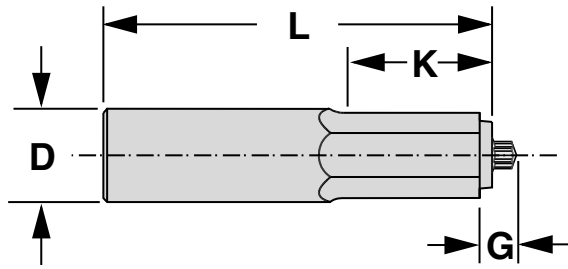


PART NUMBER	PUNCH REFERENCE	DRIVE SIZE	M REF. inch / mm	A inch / mm	D inch / mm
1110-06-175	6-TMI-175	6	-	.070 / 1,77	.437 / 11,11
1110-07-175	7-TMI-175	7	-	.082 / 2,09	.437 / 11,11
1110-08-175	8-TMI-175	8	-	.095 / 2,41	.437 / 11,11
1110-09-175	9-TMI-175	9	-	.102 / 2,59	.437 / 11,11
1110-10-175	10-TMI-175	10	-	.111 / 2,81	.562 / 14,27
1110-15-175	15-TMI-175	15	-	.132 / 3,35	.562 / 14,27
1110-20-175	20-TMI-175	20	-	.155 / 3,93	.562 / 14,27
1110-25-175	25-TMI-175	25	-	.178 / 4,52	.875 / 22,22
1110-27-175	27-TMI-175	27	-	.200 / 5,08	.875 / 22,22
1110-30-175	30-TMI-175	30	-	.221 / 5,61	.875 / 22,22
1110-40-175	40-TMI-175	40	-	.267 / 6,78	.875 / 22,22
1110-45-175	45-TMI-175	45	-	.313 / 7,95	1.250 / 31,75
1110-50-175	50-TMI-175	50	-	.353 / 8,96	1.250 / 31,75
1110-55-175	55-TMI-175	55	-	.477 / 11,35	1.250 / 31,75

MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 62-64

# #1111 6-LOBE (TX) HEX FLANGE PUNCH PIN

TXP-56

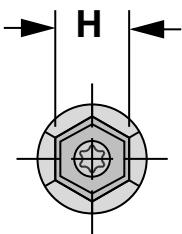
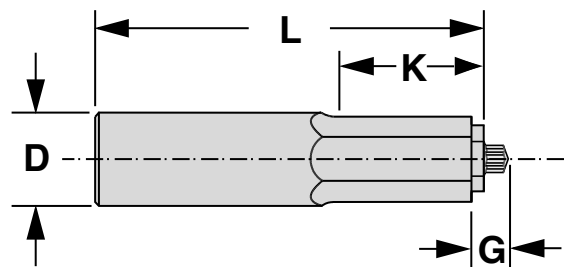


PART NUMBER	DRIVE SIZE	D inch / mm	G inch / mm	H inch / mm	K inch / mm	L inch / mm
1111-10	10	.305 / 7.74	.045 / 1,14	.147 / 3,74	.687 / 17,45	1.227 / 31,16
1111-15	15	.305 / 7.74	.050 / 1,27	.185 / 4,70	.687 / 17,45	1.227 / 31,16
1111-20	20	.305 / 7.74	.065 / 1,65	.205 / 5,20	.687 / 17,45	1.227 / 31,16
1111-25	25	.369 / 9.37	.070 / 1,78	.261 / 6,63	.687 / 17,45	1.227 / 31,16
1111-30	30	.492 / 12,49	.080 / 2,03	.301 / 7,65	.687 / 17,45	1.227 / 31,16
1111-40	40	.499 / 12,67	.095 / 2,41	.379 / 9,63	1.250 / 31,75	1.559 / 39,60
1111-50	50	.617 / 15,67	.115 / 2,92	.495 / 12,57	1.250 / 31,75	1.559 / 39,60
1111-55	55	.680 / 17,28	.140 / 3,55	.574 / 14,59	1.250 / 31,75	1.559 / 39,60

MATERIAL: M-2 HIGH SPEED STEEL  
 HARDNESS: RC 62-64  
 COATINGS: AVAILABLE UPON REQUEST

# #1112 6-LOBE (TX) HEX WASHER PUNCH PIN

TMP-34



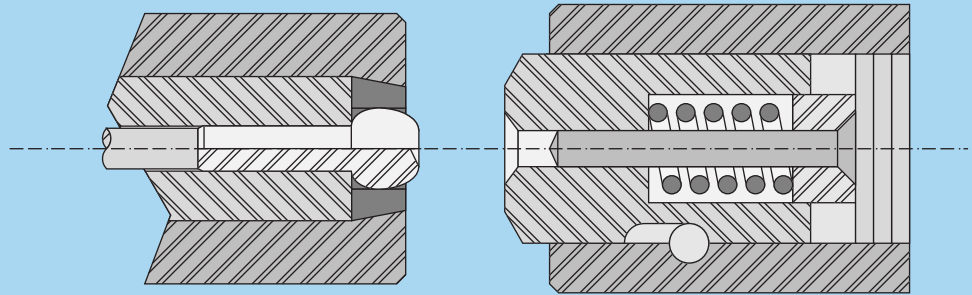
PART NUMBER	DRIVE SIZE	D inch / mm	G inch / mm	H inch / mm	K inch / mm	L inch / mm
1112-10	10	.307 / 7,80	.045 / 1,14	.179 / 4,55	.687 / 17,44	1.227 / 31,16
1112-15	15	.307 / 7,80	.050 / 1,27	.242 / 6,15	.687 / 17,44	1.227 / 31,16
1112-20	20	.307 / 7,80	.065 / 1,65	.242 / 6,15	.687 / 17,44	1.227 / 31,16
1112-25	25	.372 / 9,45	.070 / 1,78	.302 / 7,67	.687 / 17,44	1.227 / 31,16
1112-27	27	.371 / 9,45	.080 / 2,03	.302 / 7,67	.687 / 17,44	1.227 / 31,16
1112-30	30	.494 / 12,54	.095 / 2,41	.364 / 9,25	1.250 / 31,75	1.559 / 39,60
1112-40	40	.619 / 15,72	.115 / 2,92	.487 / 12,37	1.250 / 31,75	1.559 / 39,60
1112-45	45	.619 / 15,72	.140 / 3,55	.548 / 13,92	1.250 / 31,75	1.559 / 39,60

MATERIAL: M-2 HIGH SPEED STEEL  
 HARDNESS: RC 62-64  
 COATINGS: AVAILABLE UPON REQUEST

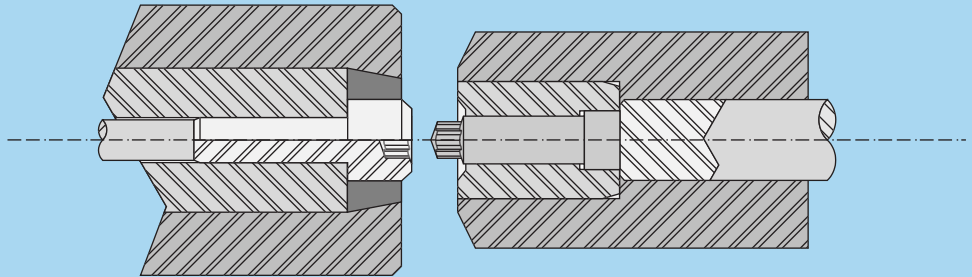


# HEXALOBULAR / 6-LOBE (TX) PUNCH & INSERT ASSEMBLY

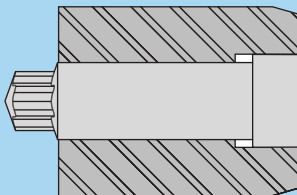
1st UPSET BLOW



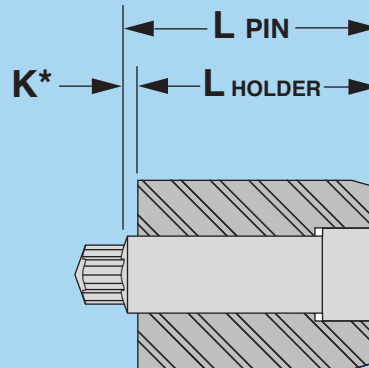
2nd FINISHING BLOW



(Wrong)



(Figure 1)

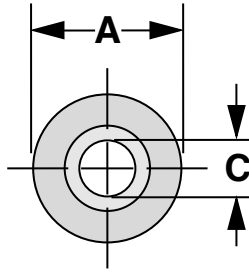
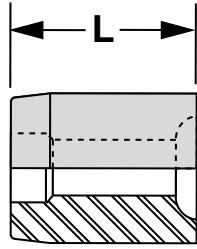


(Figure 2)

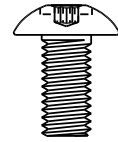
MFG. NOTE: THE TWO PIECE PUNCH AND INSERT DESIGN REQUIRES THAT THE PUNCH PROTRUDE PAST THE FACE OF THE INSERT BY THE "K\*" DISTANCE .005"/0.10mm MIN. (SEE FIG. 2) TO AVOID METAL FLASHING INTO THE INSERT. A SMALL RING RECESS IN THE TOP OF THE SCREW HEAD IS PERMISSIBLE DUE TO THE DESIGN. IF THE EDGE OF THE PUNCH IS FLUSH WITH THE INSERT FACE AS SHOWN IN (FIG. 1) MATERIAL WILL FLOW INTO THE INSERT AND THE SCREW WILL HAVE FLASH AROUND THE RECESS. SMALLER SIZES UP TO #9 MAY SHOW A FLASH CONDITION DUE TO REQUIRED TOLERANCES.

# #1140 6-LOBE (TX) PUNCH INSERTS

TXP-33.4B



STRUCK SLOT  
PAN HEAD

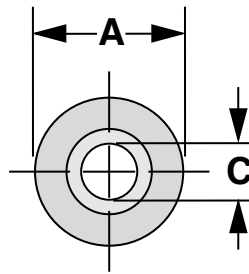
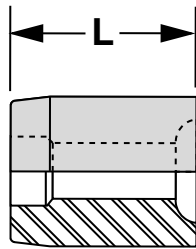


PART NUMBER	INSERT REFERENCE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1140-07	7-TXI-270	7	.562	14,27	.140	3,58	.659	16,73
1140-08	8-TXI-270	8	.562	14,27	.157	3,99	.667	16,94
1140-09	9-TXI-270	9	.562	14,27	.175	4,44	.675	17,15
1140-10	10-TXI-270	10	.562	14,27	.193	4,90	.682	17,32
1140-15	15-TXI-270	15	.562	14,27	.216	5,49	.689	17,50
1140-20	20-TXI-270	20	.562	14,27	.255	6,48	.703	17,86
1140-25	25-TXI-270	25	.875	22,23	.294	7,47	.713	18,11
1140-27	27-TXI-270	27	.875	22,23	.333	8,46	.728	18,49
1140-30	30-TXI-270	30	.875	22,23	.379	9,63	.743	18,87
1140-40	40-TXI-270	40	1.000	25,40	.468	11,89	.887	22,53
1140-45	45-TXI-270	45	1.250	31,75	.563	14,30	1.171	29,74
1140-50	50-TXI-270	50	1.250	31,75	.651	16,54	1.201	30,50
1140-55	55-TXI-270	55	1.250	31,75	.761	19,33	1.230	31,24

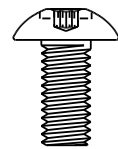
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1141 6-LOBE (TX) METRIC PUNCH INSERTS

TMP-49B



METRIC STRUCK SLOT  
PAN HEAD

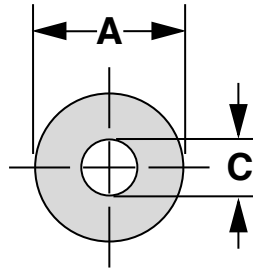
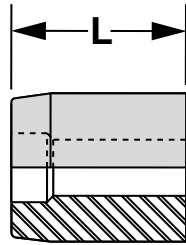


PART NUMBER	INSERT REFERENCE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1141M-08	8-TMI-272	8	.562	14,27	.159	4,04	.650	16,53
1141M-10-3	10-TMI-272	10	.562	14,27	.179	4,55	.650	16,53
1141M-10-3.5	10-TMI-273	10	.562	14,27	.179	4,55	.659	16,73
1141M-15	15-TMI-271	15	.562	14,27	.199	5,05	.655	16,64
1141M-20-4.0	20-TMI-272	20	.562	14,27	.224	5,69	.660	16,76
1141M-20-8.0	20-TMI-273	20	.562	14,27	.223	5,66	.678	17,22
1141M-25	25-TMI-271	25	.875	22,23	.269	6,83	.670	17,02
1141M-30-6.0	30-TMI-272	30	.875	22,23	.369	9,37	.678	17,22
1141M-30	30-TMI-273	30	.875	22,23	.369	9,37	.678	17,22
1141M-40	40-TMI-272	40	1.000	25,40	.449	11,40	.812	20,62
1141M-50-9.5	50-TMI-272	50	1.250	31,75	.519	13,18	1.105	28,07
1141M-50	50-TMI-273	50	1.250	31,75	.519	13,18	1.129	28,68

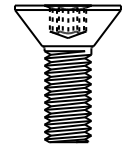
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1150 6-LOBE (TX) PUNCH INSERTS

TXP-22



FLAT HEAD  
SCREW

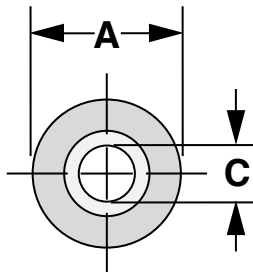
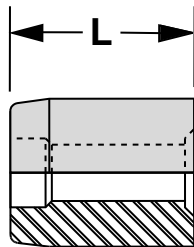


PART NUMBER	INSERT REFERENCE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1150-10	10-TXI-201	10	.562	14,27	.114	2,92	.625	15,87
1150-15	15-TXI-201	15	.562	14,27	.135	3,45	.625	15,87
1150-20	20-TXI-201	20	.562	14,27	.158	4,03	.625	15,87
1150-25	25-TXI-201	25	.875	22,23	.181	4,63	.625	15,87
1150-27	27-TXI-201	27	.875	22,23	.207	5,28	.625	15,87
1150-30	30-TXI-201	30	.875	22,23	.224	5,72	.625	15,87
1150-40	40-TXI-201	40	.875	22,23	.270	6,88	.625	15,87
1150-45	45-TXI-201	45	1.000	25,40	.329	8,37	.750	19,05
1150-50	50-TXI-201	50	1.000	25,40	.373	9,49	1.000	25,40
1150-55	55-TXI-201	55	1.250	31,75	.468	11,30	1.000	25,40
1150-60	60-TXI-201	60	1.500	38,10	.561	11,30	1.000	25,40
1150-70	70-TXI-201	70	1.500	38,10	.651	11,30	1.500	38,10

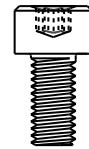
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1152 6-LOBE (TX) PUNCH INSERTS

TXP-23



SOCKET HEAD  
CAP SCREW

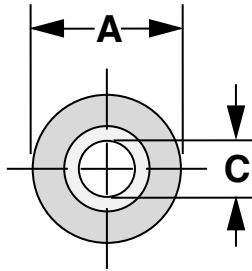
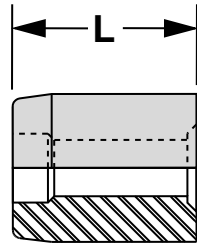


PART NUMBER	SCREW SIZE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1152-06	#2	6	.437	11,10	.074	1,89	.380	9,63
1152-08	#3	8	.437	11,10	.100	2,54	.632	16,05
1152-10-4	#4	10	.562	14,27	.115	2,92	.634	16,10
1152-10-5	#5	10	.562	14,27	.115	2,92	.634	16,10
1152-15	#6	15	.562	14,27	.136	3,45	.635	16,13
1152-25	#8	25	.562	14,27	.182	4,63	.635	16,13
1152-27	#10	27	.562	14,27	.208	5,28	.638	16,20
1152-30	1/4"	30	.562	14,27	.225	5,72	.643	16,33
1152-40	5/16"	40	.875	22,23	.330	8,37	1.020	25,91
1152-45	3/8"	45	1.000	25,40	.374	9,49	1.025	26,03
1152-50-43	7/16"	50	1.250	31,75	.469	11,90	1.030	26,16
1152-55-50	1/2"	55	1.250	31,75	.469	11,90	1.035	26,29

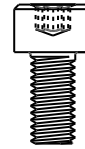
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1153 6-LOBE (TX) METRIC PUNCH INSERTS

TMF-17 012



METRIC SOCKET  
HEAD CAP SCREW

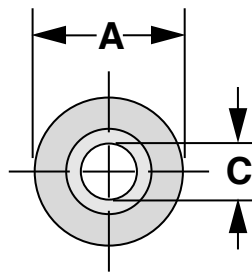
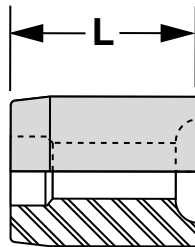


PART NUMBER	SCREW SIZE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1153M-08	M2,5	8	.438	11,11	.099	2,51	.632	16,05
1153M-10	M3	10	.563	14,29	.115	2,92	.632	16,05
1153M-20	M4	20	.563	14,29	.159	4,03	.634	16,10
1153M-25	M5	25	.563	14,29	.182	4,63	.636	16,15
1153M-30	M6	30	.875	22,23	.225	5,72	.639	16,23
1153M-45	M8	45	.875	22,23	.330	8,37	1.018	25,86
1153M-50	M10	50	1.000	25,40	.374	9,49	1.022	25,96
1153M-55	M12	55	1.250	31,75	.469	11,90	1.027	26,09
1153M-60	M14	60	1.375	34,92	.562	14,27	1.031	26,19
1153M-70	M16	70	1.500	38,10	.651	11,30	1.500	38,10
1153M-80	M18	80	1.500	38,10	.733	18,61	1.500	38,10
1153M-90	M20	90	1.500	38,10	.829	21,05	1.500	38,10

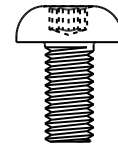
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1155 6-LOBE (TX) PUNCH INSERTS

TXP-26



SOCKET BUTTON  
HEAD SCREW

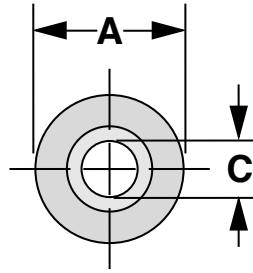
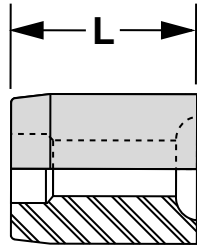


PART NUMBER	SCREW SIZE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1155-06	#2	6	.437	11,10	.074	1,89	.408	10,36
1155-08	#4	8	.437	11,10	.074	1,89	.669	16,99
1155-10	#6	10	.562	14,27	.114	2,89	.680	17,27
1155-10	#8	10	.562	14,27	.114	2,89	.680	17,27
1155-15	#10	15	.562	14,27	.135	3,45	.692	17,58
1155-25	1/4"	25	.562	14,27	.181	4,63	.705	17,91
1155-27	5/16"	27	.875	22,23	.207	5,28	.733	18,62
1155-40	3/8"	40	.875	22,23	.270	6,88	.885	22,48
1155-45	7/16"	45	1.000	25,40	.329	8,37	1.165	29,59
1155-55	1/2"	55	1.250	31,75	.468	11,90	1.218	30,94
1155-60	5/8"	60	1.250	31,75	.561	14,27	1.280	32,51

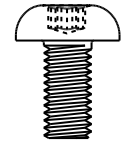
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1156 6-LOBE (TX) METRIC PUNCH INSERTS

TMP-46



METRIC SOCKET  
BUTTON HEAD SCREW

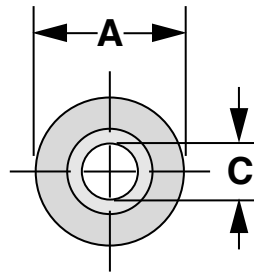
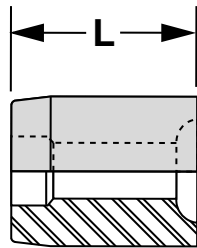


PART NUMBER	SCREW SIZE	DRIVE SIZE	A inch / mm	C inch / mm	L inch / mm
1156-08-3	M3	8	.563 / 14,29	.100 / 2,54	.682 / 17,32
1156-10-3.5	M3,5	10	.563 / 14,29	.115 / 2,92	.692 / 17,58
1156-15	M4	15	.563 / 14,29	.136 / 3,45	.702 / 17,83
1156-25	M5	25	.875 / 22,23	.182 / 4,63	.722 / 18,34
1156-27	M6	27	.875 / 22,23	.208 / 5,28	.740 / 18,80
1156-40	M8	40	1.000 / 25,40	.271 / 6,88	.907 / 23,04
1156-45	M10	45	1.250 / 31,75	.330 / 8,37	1.201 / 30,50
1156-55-12	M12	55	1.375 / 34,92	.469 / 11,90	1.243 / 31,57
1156-55-14	M14	55	1.375 / 34,92	.469 / 11,90	1.287 / 32,69
1156-60	M16	60	1.500 / 38,10	.562 / 14,27	1.322 / 33,58

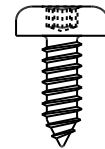
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1157 6-LOBE (TX) PUNCH INSERTS

TXP-33



FLAT TOP PAN  
HEAD SCREW

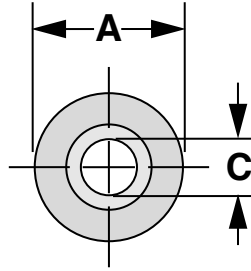
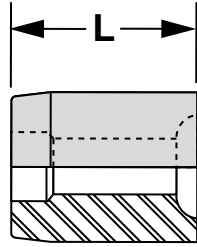


PART NUMBER	SCREW SIZE	DRIVE SIZE	A inch / mm	C inch / mm	L inch / mm
1157-08-2	#2	8	.438 / 11,11	.100 / 2,54	.645 / 16,38
1157-08-3	#3	8	.438 / 11,11	.100 / 2,54	.645 / 16,38
1157-10-4	#4	10	.563 / 14,29	.115 / 2,92	.648 / 16,46
1157-10-5	#5	10	.563 / 14,29	.115 / 2,92	.650 / 16,51
1157-15	#6	15	.563 / 14,29	.136 / 3,45	.652 / 16,56
1157-20	#8	20	.563 / 14,29	.159 / 4,03	.657 / 16,69
1157-25	#10	25	.563 / 14,29	.182 / 4,63	.663 / 16,84
1157-27	#12	27	.875 / 22,23	.208 / 5,28	.668 / 16,97
1157-30	1/4"	30	1.000 / 25,40	.225 / 5,72	.675 / 17,14
1157-40	5/16"	40	1.000 / 25,40	.271 / 6,88	.812 / 20,62
1157-45	3/8"	45	1.250 / 31,75	.330 / 8,37	1.074 / 27,28
1157-50	7/16"	50	1.250 / 31,75	.373 / 8,38	1.084 / 27,53
1157-55	1/2"	55	1.250 / 31,75	.469 / 11,91	1.099 / 27,91

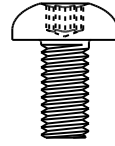
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1159 6-LOBE (TX) PUNCH INSERTS

TMP-33.5



FULL CROWN PAN HEAD  
SCREW

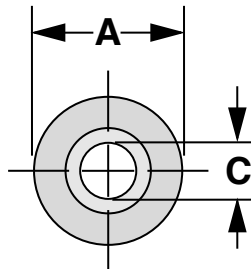
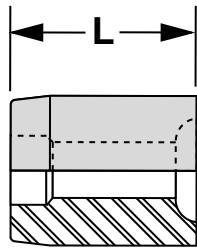


PART NUMBER	SCREW SIZE	DRIVE SIZE	A inch / mm	C inch / mm	L inch / mm
1159-8-2	#2	8	.438 / 11,11	.100 / 2,54	.652 / 16,56
1159-8-3	#3	8	.438 / 11,11	.100 / 2,54	.656 / 16,66
1159-10-4	#4	10	.563 / 14,29	.115 / 2,92	.660 / 16,76
1159-10-5	#5	10	.563 / 14,29	.115 / 2,92	.665 / 16,89
1159-15	#6	15	.563 / 14,29	.136 / 3,45	.668 / 16,97
1159-20	#8	20	.563 / 14,29	.159 / 4,03	.678 / 17,22
1159-25	#10	25	.875 / 22,23	.182 / 4,63	.686 / 17,42
1159-27	#12	27	.875 / 22,23	.208 / 5,28	.694 / 17,63
1159-30	1/4"	30	1.000 / 25,40	.225 / 5,72	.706 / 17,93
1159-40	5/16"	40	1.000 / 25,40	.271 / 6,88	.851 / 21,61
1159-45	3/8"	45	1.000 / 25,40	.330 / 8,37	1.122 / 28,50
1159-50	7/16"	50	1.250 / 31,75	.373 / 9,49	1.142 / 29,00

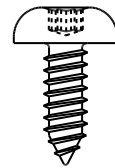
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1160 6-LOBE (TX) METRIC PUNCH INSERTS

TXP-48



METRIC PAN HEAD SHEET  
METAL SCREW

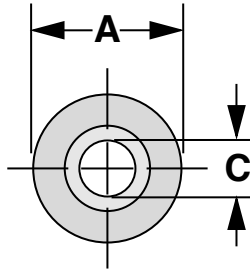
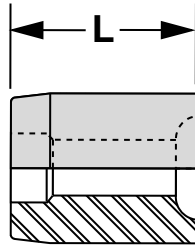


PART NUMBER	SCREW SIZE	DRIVE SIZE	A inch / mm	C inch / mm	L inch / mm
1160M-08	M2,9	8	.438 / 11,11	.100 / 2,54	.663 / 16,84
1160M-10	M3,5	10	.563 / 14,29	.115 / 2,92	.671 / 17,04
1160M-15	M3,9	15	.563 / 14,29	.136 / 3,45	.675 / 17,15
1160M-20	M4,2	20	.563 / 14,29	.159 / 4,03	.679 / 17,25
1160M-25-48	M4,8	25	.875 / 22,23	.182 / 4,63	.689 / 17,50
1160M-25-55	M5,5	25	.875 / 22,23	.182 / 4,63	.697 / 17,70
1160M-30	M6,3	30	1.000 / 25,40	.225 / 5,72	.709 / 18,01

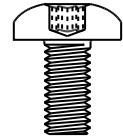
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1161 6-LOBE (TX) METRIC PUNCH INSERTS

TMP-48



METRIC PAN HEAD  
MACHINE SCREW

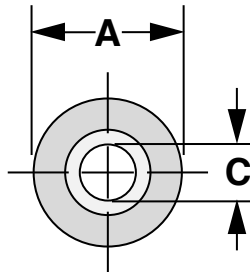
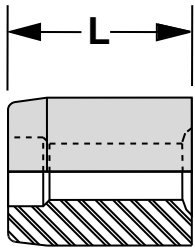


PART NUMBER	SCREW SIZE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1161M-06	M2	6	.438	11,11	.075	1,89	.394	10,01
1161M-08	M2,5	8	.438	11,11	.100	2,54	.649	16,50
1161M-10	M3	10	.563	14,29	.115	2,92	.655	16,63
1161M-15	M3,5	15	.563	14,29	.136	3,45	.659	16,73
1161M-20	M4	20	.563	14,29	.159	4,03	.663	16,85
1161M-25	M5	25	.875	22,23	.182	4,63	.672	17,08
1161M-30	M6	30	1.000	25,40	.225	5,72	.683	17,34
1161M-45	M8	45	1.000	25,40	.330	8,37	1.076	27,33
1161M-50	M10	50	1.000	25,40	.374	9,49	1.095	27,82

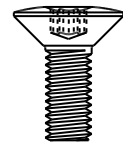
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1164 6-LOBE (TX) PUNCH INSERTS

TXP-36



OVAL HEAD  
SCREW



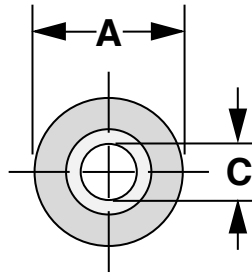
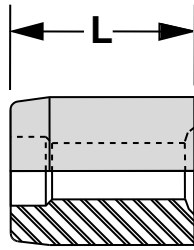
PART NUMBER	SCREW SIZE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1164-10	#5	10	.563	14,29	.115	2,92	.656	16,66
1164-15	#6	15	.563	14,29	.136	3,45	.659	16,74
1164-20	#8	20	.563	14,29	.159	4,03	.664	16,87
1164-25	#10	25	.563	14,29	.182	4,63	.671	17,04
1164-27	#12	27	.875	22,23	.208	5,28	.678	17,22
1164-30	1/4"	30	.875	22,23	.225	5,72	.687	17,45
1164-40	5/16"	40	.875	22,23	.271	6,88	.829	21,06
1164-45	3/8"	45	1.000	25,40	.330	8,37	1.094	27,79
1164-50-43	7/16"	50	1.000	25,40	.374	9,49	1.097	27,86
1164-50-50	1/2"	50	1.250	31,75	.374	9,49	1.104	28,04
1164-55-56	9/16"	55	1.250	31,75	.469	11,90	1.120	28,45
1164-55-62	5/8"	55	1.250	31,75	.469	11,90	1.135	28,83
1164-60	3/4"	60	1.500	38,10	.562	14,27	1.162	29,51

MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

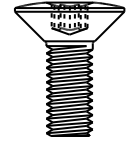


# #1165 6-LOBE (TX) METRIC PUNCH INSERTS

TMP-47



METRIC OVAL HEAD  
SCREW

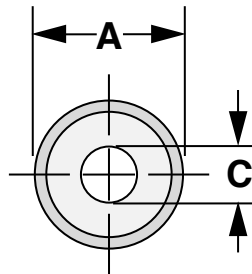
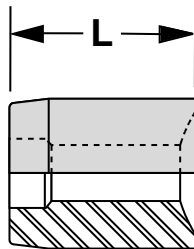


PART NUMBER	SCREW SIZE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1165-10	M3	10	.563	14,29	.115	2,92	.644	16,38
1165-15	M3.5	15	.563	14,29	.136	3,45	.651	16,53
1165-20	M4	20	.563	14,29	.159	4,03	.654	16,60
1165-25-4.8	M4.8	25	.875	22,23	.182	4,63	.661	16,79
1165-25-5.5	M5, 5.5	25	.875	22,23	.182	4,63	.669	16,79
1165-30	M6	30	.875	22,23	.225	5,72	.665	16,98
1165-45	M8	45	1.00	25,40	.330	8,37	.808	20,53
1165-50	M10	50	1.00	25,40	.374	9,49	1.093	27,77

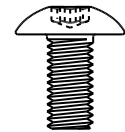
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1168 6-LOBE (TX) PUNCH INSERTS

TXP-35



TRUSS HEAD  
SCREW

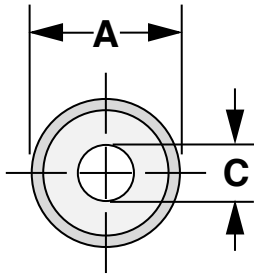
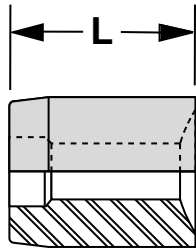


PART NUMBER	SCREW SIZE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1168-8-04	#4	8	.563	14,29	.100	2,54	.676	17,17
1168-8-05	#5	8	.563	14,29	.100	2,54	.682	17,32
1168-10	#6	10	.563	14,29	.115	2,92	.689	17,50
1168-15	#8	15	.875	22,23	.136	3,45	.701	17,81
1168-20	#10	20	.875	22,23	.159	4,03	.713	18,11
1168-25	#12	25	.875	22,23	.182	4,63	.726	18,44
1168-27	1/4"	27	.875	22,23	.208	5,28	.739	18,77
1168-40	5/16"	40	1.000	25,40	.271	6,88	.889	22,83
1168-45-37	3/8"	45	1.250	31,75	.330	8,37	1.164	29,57
1168-45-43	7/16"	45	1.500	38,10	.330	8,37	1.190	30,23
1168-50	1/2"	50	1.500	38,10	.374	9,49	1.215	30,86
1168-55-56	9/16"	55	1.500	38,10	.469	11,91	1.224	31,09
1168-55-62	5/8"	55	1.500	38,10	.469	11,91	1.274	32,36
1168-60	3/4"	60	1.750	44,45	.562	14,27	1.331	33,81

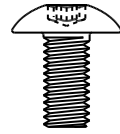
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1169 6-LOBE (TX) METRIC PUNCH INSERTS

TMP-54



METRIC TRUSS HEAD  
SCREW

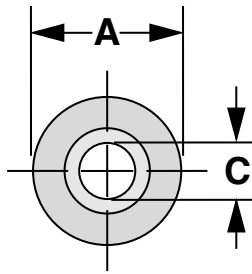
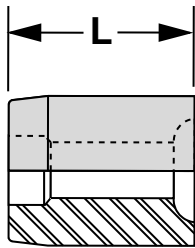


PART NUMBER	SCREW SIZE	DRIVE SIZE	A inch / mm	C inch / mm	L inch / mm
1169-10	M3.5	10	.563 / 14,29	.115 / 2,92	.687 / 17,45
1169-15	M4	15	.563 / 14,29	.156 / 3,96	.701 / 17,80
1169-20	M5	20	.563 / 14,29	.188 / 4,78	.711 / 18,05
1169-30	M6	30	.875 / 22,23	.225 / 5,72	.736 / 18,75
1169-40	M8	40	.875 / 22,23	.271 / 6,88	.895 / 22,73
1169-50	M10	50	1.250 / 31,75	.374 / 9,49	1.213 / 30,82

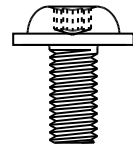
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1170 6-LOBE (TX) PUNCH INSERTS

TXP-32



ROUND WASHER  
HEAD SCREW

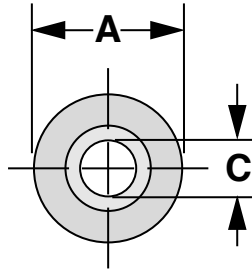
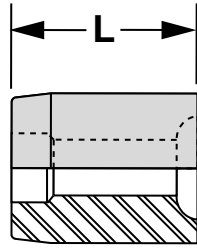


PART NUMBER	SCREW SIZE	DRIVE SIZE	A inch / mm	C inch / mm	L inch / mm
1170-10-04	#4	10	.563 / 14,29	.115 / 2,92	.685 / 17,40
1170-10-05	#5	10	.563 / 14,29	.115 / 2,92	.694 / 17,63
1170-15	#6	15	.563 / 14,29	.136 / 3,45	.716 / 18,19
1170-20	#8	20	.563 / 14,29	.159 / 4,03	.718 / 18,24
1170-25	#10	25	.875 / 22,23	.182 / 4,63	.732 / 18,59
1170-27	#12	27	.875 / 22,23	.208 / 5,28	.781 / 19,84
1170-30	1/4"	30	1.000 / 25,40	.225 / 5,72	.774 / 19,66

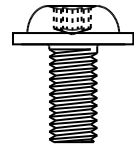
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1171 6-LOBE (TX) METRIC PUNCH INSERTS

TMP-50



METRIC ROUND WASHER  
HEAD SCREW

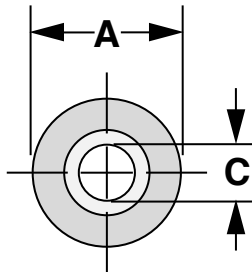
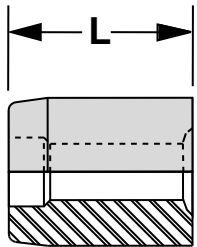


PART NUMBER	SCREW SIZE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1171-10-3.0	M3	10	.563	14,29	.115	2,92	.667	16,95
1171-10-3.5	M3.5	10	.563	14,29	.115	2,92	.679	17,25
1171-20-4.0	M4	20	.563	14,29	.159	4,03	.683	17,35
1171-20-5.0	M5	20	.563	14,29	.159	4,03	.687	17,45
1171-20-6.0	M6	20	.563	14,29	.159	4,03	.691	17,55
1171-30	M7	30	.875	22,23	.225	5,72	.738	18,75
1171-40	M8	40	.875	22,23	.271	6,88	.863	21,92
1171-50	M10	50	1.00	25,40	.374	9,49	1.117	28,37

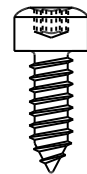
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #1175 6-LOBE (TX) PUNCH INSERTS

TXP-37



FILLISTER HEAD  
SCREW



PART NUMBER	SCREW SIZE	DRIVE SIZE	A		C		L	
			inch	mm	inch	mm	inch	mm
1175-10-04	#4	10	.563	14,29	.115	2,92	.650	16,51
1175-10-05	#5	10	.563	14,29	.115	2,92	.655	16,63
1175-15	#6	15	.563	14,29	.136	3,45	.659	16,73
1175-20	#8	20	.563	14,29	.159	4,03	.666	16,91
1175-25	#10	25	.875	22,23	.182	4,63	.673	17,09
1175-27	#12	27	.875	22,23	.208	5,28	.680	17,27
1175-30	1/4"	30	.875	22,23	.225	5,72	.690	17,52
1175-40	5/16"	40	.875	22,23	.271	6,88	.832	21,13
1175-45	3/8"	45	1.000	25,40	.330	8,37	1.099	27,91
1175-50	7/16"	50	1.000	25,40	.374	9,49	1.100	27,94
1175-55-50	1/2"	55	1.250	31,75	.469	11,90	1.112	28,24
1175-55-56	9/16"	55	1.250	31,75	.469	11,90	1.127	28,63
1175-60	5/8"	60	1.500	38,10	.562	14,27	1.143	29,03
1175-70	3/4"	70	1.500	38,10	.652	16,56	1.668	42,36

MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# UNIVERSAL 6-LOBE (TX) & HEXALOBULAR GAGES

## • ISO, EN, DIN, JIS, IFI, NAS, ANSI Standards

Industries currently using the ISO Hexalobular / Six-Lobe Fasteners include NAS Aerospace, Appliances, USA & European Automotive, Commercial, Electronics, Military, Nuclear, Medical Devices, and other applications. Universal Punch Corp. has become a preferred supplier to worldwide manufacturing markets through superior quality, specialized engineering and technical support, and cost effective stocking inventory of standard tools and gauges. • Global Tooling Supplies.

## • Manufacturing Standards & Documents

Around the world, several international and governmental committees (ISO, EN, DIN, JIS, IFI, NAS, ANSI) have published the fastener manufacturing standards with all the gauging documents that provide the technical data ("know-how") support for most common designs. These controlled documents are consistently updated and the necessary manufacturing technology can be obtained from numerous on-line agencies or document stores with current revisions, which provides worldwide document uniformity of contr



## • International Gauging Standards

Universal Punch Corp. Hexalobular / Six-Lobe (TX), and Star Drive Type Gages are manufactured to proprietary tolerances and certified to the strictest requirements. Our accredited state-of-the-art laboratory ensures that all products sold conform to ISO 10012 and ISO guide 25 specifications. All measuring equipment and gauging masters are directly traceable to N.I.S.T. for international uniformity. Our calibration services ensure the gauging standards used by manufacturers remains consistent and within the established specifications. • Production and Inspection Gages

## • Technical Advantages with Economic Benefits

• ISO, EN, DIN, JIS, IFI, NAS, ANS Standards • ISO10664- • ISO12257  
• NAS1800 • IFI-562 • DIN 34800 • JIS B1015 • Ford WB900 • Chrysler PS-6849 • Mercedes MBN10144 • GM C215 • Delphi DX500034

## • Gage Re-Certification

To help maintain compliance with standards for both internal sizes T1 - T100 and external sizes E1 - E44 we offer gage calibration laboratory services to re-certify and repair Hexalobular, Six-Lobe, and medical Star type configurations. All measurements performed are in accordance with ISO-Guide 25 and all reference masters are directly traceable to N.I.S.T. We recommend your gages be routinely re-certified based on their use, to ensure that the gaging members and dial indicators are accurate and reliable.

## • Gage Type and Classification

MANUFACTURING AND RECEIVING INSPECTION • PENETRATION • FALLAWAY PENETRATION • GO NO-GO INTERNAL • GO FINAL • TAMPER RECESSES • RECEIVING INSPECTION • NOGO-FALLAWAY • FINAL INSPECTION EXTERNAL • GO NO-GO EXTERNAL • DRIVER BIT, KEY & SCREWDRIVER • TAPERED BIT GO • SOCKET DRIVER GO • TORSIONAL TEST BLOCKS • PLATING THICKNESS GO NO-GO



# #1180 6-LOBE (TX) PENETRATION GAGES

TMF/TXQ-809

## INTERNAL RECESS DRIVES STANDARD REFERENCES TMF/TXQ-809

PART NUMBER	DRIVE SIZE
1180-01	1
1180-02	2
1180-03	3
1180-04	4
1180-05	5
1180-06	6
1180-07	7
1180-08	8
1180-09	9
1180-10	10
1180-15	15
1180-20	20
1180-25	25
1180-27	27
1180-30	30
1180-40	40
1180-45	45
1180-50	50
1180-55	55
1180-60	60
1180-70	70
1180-80	80
1180-90	90
1180-100	100



When Ordering Specify: Inch or Metric Dial Indicators  
SPC-Compatible With Digital Indicators  
Note: Tamper-Proof Style Available (Sizes #10 Thru #45)

# #1181 6-LOBE (TX) GO PRODUCTION GAGES

TMF/TXQ-804

## INTERNAL RECESS DRIVES STANDARD REFERENCES TMF/TXQ-804

PART NUMBER	DRIVE SIZE
1181-01	1
1181-02	2
1181-03	3
1181-04	4
1181-05	5
1181-06	6
1181-07	7
1181-08	8
1181-09	9
1181-10	10
1181-15	15
1181-20	20
1181-25	25
1181-27	27
1181-30	30
1181-40	40
1181-45	45
1181-50	50
1181-55	55
1181-60	60
1181-70	70
1181-80	80
1181-90	90
1181-100	100



When Ordering Specify: Inch or Metric Dial Indicators  
SPC-Compatible With Digital Indicators  
Note: Tamper-Proof Style Available (Sizes #10 Thru #45)



# #1182 6-LOBE (TX) NOGO FALLAWAY GAGES

TMF/TXQ-812

## INTERNAL RECESS DRIVES STANDARD REFERENCES TMF/TXQ-812

PART NUMBER	DRIVE SIZE
1182-01	1
1182-02	2
1182-03	3
1182-04	4
1182-05	4
1182-06	5
1182-07	6
1182-08	7
1182-09	8
1182-10	9
1182-15	10
1182-20	15
1182-25	20
1182-27	25
1182-30	27
1182-40	30
1182-45	40
1182-50	45
1182-55	50
1182-60	55
1182-70	60
1182-80	70
1182-90	80
1182-100	90
	100



When Ordering Specify: Inch or Metric Dial Indicators  
SPC-Compatible With Digital Indicators  
Note: Tamper-Proof Style Available (Sizes #10 Thru #45)

# #1184 6-LOBE (TX) GO-NOGO GAGES

TMF/TXQ-804A

## INTERNAL RECESS DRIVES STANDARD REFERENCES TMF/TXQ-804A

PART NUMBER	DRIVE SIZE
1184-01	1
1184-02	2
1184-03	3
1184-04	4
1184-05	4
1184-06	5
1184-07	6
1184-08	7
1184-09	8
1184-10	9
1184-15	10
1184-20	15
1184-25	20
1184-27	25
1184-30	27
1184-40	30
1184-45	40
1184-50	45
1184-55	50
1184-60	55
1184-70	60
1184-80	70
1184-90	80
1184-100	90
	100



Universal's Gage Probes are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

## INTERNAL RECESS DRIVES STANDARD REFERENCES TMF/TXQ-811

PART NUMBER	DRIVE SIZE
1185-01	1
1185-02	2
1185-03	3
1185-04	4
1185-05	5
1185-06	6
1185-07	7
1185-08	8
1185-09	9
1185-10	10
1185-15	15
1185-20	20
1185-25	25
1185-27	27
1185-30	30
1185-40	40
1185-45	45
1185-50	50
1185-55	55
1185-60	60
1185-70	70
1185-80	80
1185-90	90
1185-100	100



Universal's Gage Probes are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

# #1190 HEXALOBULAR GO PENETRATION GAGES IFI-562 & ISO10664

## INTERNAL RECESS DRIVES REFERENCE STANDARDS STANDARD REFERENCES IFI 562 & ISO10664 3.3.1

PART NUMBER	DRIVE SIZE
1190-06	6
1190-08	8
1190-10	10
1190-15	15
1190-20	20
1190-25	25
1190-30	30
1190-40	40
1190-45	45
1190-50	50
1190-55	55
1190-60	60
1190-70	70
1190-80	80
1190-90	90
1190-100	100



When Ordering Specify: Inch or Metric Dial Indicators  
SPC-Compatible With Digital Indicators  
Note: Tamper-Proof Style Available (Sizes #10 Thru #45)



# #1194 HEXALOBULAR GO-NOGO GAGES

IFI-562 & ISO10664

## INTERNAL RECESS DRIVES

STANDARD REFERENCES IFI-562 & ISO10664 3.2 & 3.3

PART NUMBER	DRIVE SIZE
1194-06	6
1194-08	8
1194-10	10
1194-15	15
1194-20	20
1194-25	25
1194-30	30
1194-40	40
1194-45	45
1194-50	50
1194-55	55
1194-60	60
1194-70	70
1194-80	80
1194-90	90
1194-100	100



Universal's Gage Probes are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

# #1195 HEXALOBULAR FALLAWAY GAGES

IFI-562 & ISO10664

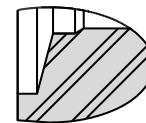
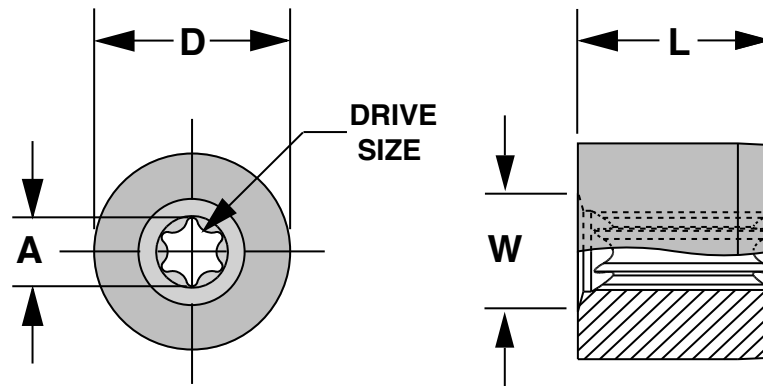
## INTERNAL RECESS DRIVES

STANDARD REFERENCES IFI-562 & ISO10664 3.3.2

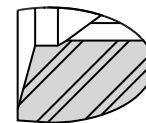
PART NUMBER	DRIVE SIZE
1195-06	6
1195-08	8
1195-10	10
1195-15	15
1195-20	20
1195-25	25
1195-30	30
1195-40	40
1195-45	45
1195-50	50
1195-55	55
1195-60	60
1195-70	70
1195-80	80
1195-90	90
1195-100	100



When Ordering Specify: Inch or Metric Dial Indicators  
SPC-Compatible With Digital Indicators  
Note: Tamper-Proof Style Available (Sizes #10 Thru #45)



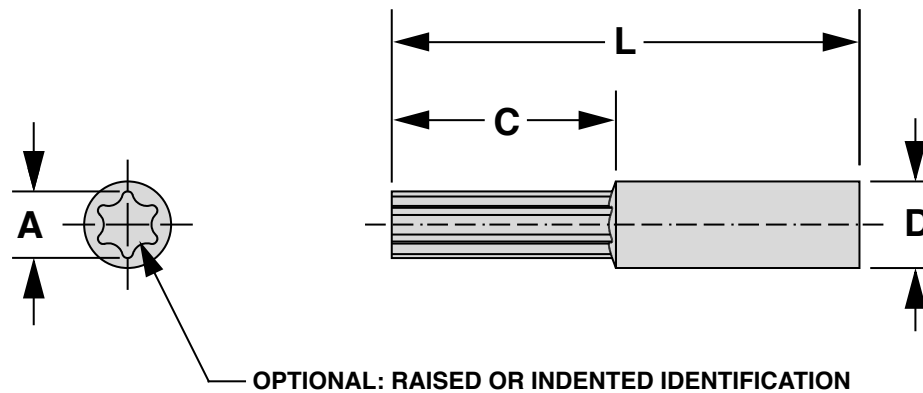
SIZE E4 TO E6



SIZE E7 AND LARGER

PART NUMBER	DRIVE SIZE	A		D		L		W	
		inch	mm	inch	mm	inch	mm	inch	mm
2000-04	E-4	.145	3,68	.500	12,70	.500	12,70	.218	5,54
2000-05	E-5	.179	4,54	.625	15,87	.500	12,70	.260	6,60
2000-06	E-6	.217	5,51	.625	15,87	.500	12,70	.297	7,54
2000-07	E-7	.236	5,99	.750	19,05	.750	19,05	.437	11,10
2000-08	E-8	.286	7,26	.750	19,05	.750	19,05	.562	14,27
2000-10	E-10	.361	9,17	1.000	25,40	1.000	25,40	.732	18,59
2000-11	E-11	.387	9,83	1.000	25,40	1.000	25,40	.631	16,03
2000-12	E-12	.430	10,92	1.250	31,75	1.000	25,40	.957	24,31
2000-14	E-14	.498	12,65	1.250	31,75	1.000	25,40	1.070	27,18
2000-16	E-16	.570	14,48	1.250	31,75	1.000	25,40	.852	21,64
2000-18	E-18	.643	16,33	1.250	31,75	1.000	25,40	1.152	29,26
2000-20	E-20	.713	18,11	1.500	38,10	1.500	38,10	1.301	33,05
2000-24	E-24	.844	21,44	2.000	50,80	1.500	38,10	1.516	38,51
2000-28	E-28	.998	25,34	2.000	50,80	1.750	44,45	1.702	43,23
2000-32	E-32	1.136	28,85	2.000	50,80	1.750	44,45	1.862	47,29
2000-36	E-36	1.278	32,46	2.000	50,80	1.750	44,45	1.787	45,38
2000-40	E-40	1.418	36,01	2.500	57,15	1.750	44,45	1.975	50,16
2000-44	E-44	1.560	39,62	2.500	57,15	1.750	44,45	2.162	54,91

MATERIAL: CARBIDE  
 TOLERANCE: I.D.'S CONCENTRIC WITHIN .0005"/0,002mm  
 NON-STANDARD SIZES AVAILABLE TO YOUR SPECIFICATIONS.

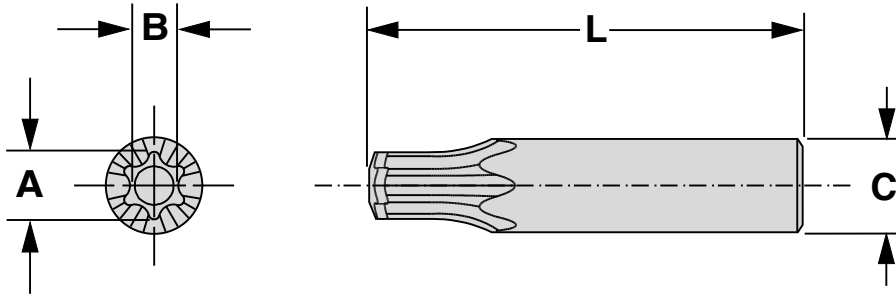


PART NUMBER	DRIVE SIZE	A inch / mm	C inch / mm	D inch / mm	L inch / mm
2006-04	E-4	.143 / 3,63	.625 / 15,88	.159 / 4,04	1.625 / 41,27
2006-05	E-5	.178 / 4,52	.625 / 15,88	.191 / 4,85	1.625 / 41,27
2006-06	E-6	.214 / 5,44	.625 / 15,88	.253 / 6,43	1.625 / 41,27
2006-07	E-7	.233 / 5,92	.875 / 22,23	.293 / 7,44	1.875 / 47,62
2006-08	E-8	.282 / 7,16	.875 / 22,23	.325 / 8,25	1.875 / 47,62
2006-10	E-10	.357 / 9,07	1.125 / 28,57	.400 / 10,16	2.125 / 53,97
2006-11	E-11	.383 / 9,73	1.125 / 28,57	.429 / 10,90	2.125 / 53,97
2006-12	E-12	.425 / 10,80	1.125 / 28,57	.478 / 12,14	2.125 / 53,97
2006-14	E-14	.493 / 12,52	1.125 / 28,57	.564 / 14,33	2.125 / 53,97
2006-16	E-16	.565 / 14,35	1.125 / 28,57	.625 / 15,88	2.125 / 53,97
2006-18	E-18	.637 / 16,18	1.125 / 28,57	.690 / 17,53	2.125 / 53,97
2006-20	E-20	.707 / 17,96	1.625 / 41,27	.753 / 19,13	2.875 / 73,02
2006-24	E-24	.837 / 21,26	1.625 / 41,27	.894 / 22,71	2.875 / 73,02
2006-28	E-28				
2006-32	E-32				
2006-36	E-36				
2006-40	E-40				
2006-44	E-44				

USE ROUND KNOCKOUT PIN DESIGN.

MATERIAL: S-7 TOOL STEEL  
 HARDNESS: RC 60-62  
 OPTIONAL: RAISED OR INDENTED IDENTIFICATION AVAILABLE

# #2015 6-LOBE (TX) SOCKET PUNCHES



PART NUMBER	DRIVE SIZE	A inch / mm	B inch / mm	C inch / mm	L inch / mm
2015-04	E-4	.152 / 3,86	.112 / 2,84	.315 / 8,00	2.36 / 60
2015-05	E-5	.187 / 4,75	.136 / 3,46	.315 / 8,00	2.36 / 60
2015-06	E-6	.226 / 5,74	.162 / 4,11	.315 / 8,00	2.36 / 60
2015-07	E-7	.245 / 6,22	.159 / 4,05	.315 / 8,00	2.36 / 60
2015-08	E-8	.296 / 7,52	.198 / 5,04	.472 / 12,00	3.15 / 80
2015-10	E-10	.371 / 9,42	.272 / 6,92	.472 / 12,00	3.15 / 80
2015-11	E-11	.397 / 10,08	.284 / 7,22	.472 / 12,00	3.15 / 80
2015-12	E-12	.440 / 11,17	.316 / 8,03	.472 / 12,00	3.15 / 80
2015-14	E-14	.508 / 12,90	.367 / 9,32	.748 / 19,00	3.93 / 100
2015-16	E-16	.581 / 14,76	.419 / 10,64	.748 / 19,00	3.93 / 100
2015-18	E-18	.657 / 16,70	.475 / 12,07	.748 / 19,00	3.93 / 100
2015-20	E-20	.728 / 18,49	.527 / 13,39	.748 / 19,00	3.93 / 100
2015-22	E-22	.800 / 20,32	.592 / 15,03	1.063 / 27,00	4.72 / 120
2015-24	E-24	.872 / 22,16	.627 / 15,93	1.063 / 27,00	4.72 / 120
2015-26	E-26	.942 / 23,93	.695 / 17,65	1.063 / 27,00	4.72 / 120
2015-28	E-28	1.012 / 25,73	.728 / 18,49	1.063 / 27,00	4.72 / 120
2015-30	E-30	1.081 / 27,46	.797 / 20,24	1.300 / 33,00	5.51 / 140
2015-32	E-32	1.151 / 29,24	.847 / 21,52	1.300 / 33,00	5.51 / 140
2015-34	E-34	1.222 / 31,04	.900 / 22,88	1.378 / 35,00	6.30 / 160
2015-36	E-36	1.294 / 32,89	.955 / 24,25	1.378 / 35,00	6.30 / 160
2015-38	E-38	1.368 / 34,75	1.009 / 25,63	1.378 / 35,00	6.30 / 160
2015-40	E-40	1.435 / 36,45	1.057 / 26,85	1.614 / 41,00	7.09 / 180
2015-42	E-42	1.507 / 38,28	1.110 / 28,20	1.614 / 41,00	7.09 / 180
2015-44	E-44	1.577 / 40,06	1.161 / 29,50	1.614 / 41,00	7.09 / 180

MATERIAL: ASP-30 SUPER HIGH SPEED STEEL  
HARDNESS: RC 65-66 TRIPLE DRAWN  
COATINGS: CVD AVAILABLE UPON REQUEST.

## FOR EXTERNAL DRIVES STANDARD REFERENCES TMF/TXQ-806.1

PART NUMBER	DRIVE SIZE
2175-04	E-4
2175-05	E-5
2175-06	E-6
2175-07	E-7
2175-08	E-8
2175-10	E-10
2175-11	E-11
2175-12	E-12
2175-14	E-14
2175-16	E-16
2175-18	E-18
2175-20	E-20
2175-22	E-22
2175-24	E-24
2175-26	E-26
2175-28	E-28
2175-30	E-30
2175-32	E-32
2175-34	E-34
2175-40	E-40
2175-42	E-42
2175-44	E-44



Universal's Gages are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

# #2178 6-LOBE (TX) NUT FINAL INSPECTION GAGES TMF/TXQ-807

## FOR EXTERNAL DRIVES STANDARD REFERENCES TMF/TXQ-807

PART NUMBER	DRIVE SIZE
2178-08	E-8
2178-10	E-10
2178-12	E-12
2178-14	E-14
2178-16	E-16
2178-18	E-18
2178-20	E-20



Universal's Gages are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

# #2185 6-LOBE (TX) FINAL ACCEPTANCE GAGES TMF/TXQ-801.1

## FOR EXTERNAL DRIVES STANDARD REFERENCES TMF/TXQ-801.1

PART NUMBER	DRIVE SIZE
2185-04	E-4
2185-05	E-5
2185-06	E-6
2185-07	E-7
2185-08	E-8
2185-10	E-10
2185-11	E-11
2185-12	E-12
2185-14	E-14
2185-16	E-16
2185-18	E-18
2185-20	E-20
2185-24	E-24
2185-28	E-28
2185-32	E-32
2185-36	E-36
2185-40	E-40
2185-44	E-44



Universal's Gages are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

## FOR EXTERNAL DRIVES STANDARD REFERENCES TMF/TQM-801

PART NUMBER	DRIVE SIZE
2190-01	E-1
2190-02	E-2
2190-04	E-4
2190-05	E-5
2190-06	E-6
2190-07	E-7
2190-08	E-8
2190-10	E-10
2190-11	E-11
2190-12	E-12
2190-14	E-14
2190-16	E-16
2190-18	E-18
2190-20	E-20
2190-24	E-24
2190-28	E-28
2190-32	E-32
2190-36	E-36
2190-40	E-40
2190-44	E-44



Universal's Gages are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

## FOR EXTERNAL DRIVES STANDARD REFERENCES TMF/TXQ-803

PART NUMBER	DRIVE SIZE
2193-01	E-1
2193-02	E-2
2193-04	E-4
2193-05	E-5
2193-06	E-6
2193-07	E-7
2193-08	E-8
2193-10	E-10
2193-11	E-11
2193-12	E-12
2193-14	E-14
2193-16	E-16
2193-18	E-18
2193-20	E-20
2193-24	E-24
2193-28	E-28
2193-32	E-32
2193-36	E-36
2193-40	E-40
2193-44	E-44



Universal's Gages are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.



## FOR EXTERNAL DRIVES STANDARD REFERENCES DIN 34801 & IFI-562

PART NUMBER	DRIVE SIZE
2194-04	E-4
2194-05	E-5
2194-06	E-6
2194-07	E-7
2194-08	E-8
2194-10	E-10
2194-11	E-11
2194-12	E-12
2194-14	E-14
2194-16	E-16
2194-18	E-18
2194-20	E-20
2194-24	E-24



Universal's Gages are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

# #2196 6-LOBE (TX) DRIVER BIT & KEY GAGES

## FOR INTERNAL DRIVER BITS AND KEYS STANDARD REFERENCES TMF/TXQ-805.1

PART NUMBER	DRIVE SIZE
2196-05	5
2196-06	6
2196-07	7
2196-08	8
2196-09	9
2196-10	10
2196-15	15
2196-20	20
2196-25	25
2196-27	27
2196-30	30
2196-40	40
2196-45	45
2196-50	50
2196-55	55
2196-60	60
2196-70	70
2196-80	80
2196-90	90
2196-100	100



Universal's Gages are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

## FOR INTERNAL DRIVER BITS AND KEYS STANDARD REFERENCES TMF/TXQ-805.4

PART NUMBER	DRIVE SIZE
2197-05	5
2197-06	6
2197-07	7
2197-08	8
2197-09	9
2197-10	10
2197-15	15
2197-20	20
2197-25	25
2197-27	27
2197-30	30
2197-40	40
2197-45	45
2197-50	50
2197-55	55
2197-60	60
2197-70	70
2197-80	80
2197-90	90
2197-100	100



Universal's Gages are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

# #2198 6-LOBE (TX) INTERNAL TAPER DRIVER BIT GAGES

## FOR INTERNAL DRIVER BITS AND KEYS UNIVERSAL STANDARD REFERENCES

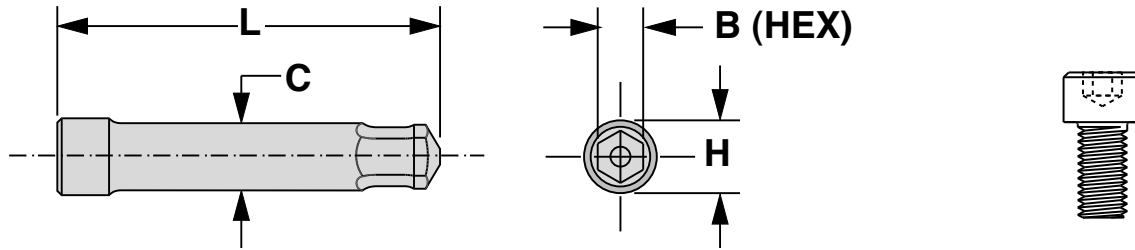
PART NUMBER	DRIVE SIZE
2198-05	5
2198-06	6
2198-07	7
2198-08	8
2198-09	9
2198-10	10
2198-15	15
2198-20	20
2198-25	25
2198-27	27
2198-30	30
2198-40	40
2198-45	45
2198-50	50
2198-55	55



Universal's Gages are heat treated, thermally stabilized, and surface treated. This provides additional hardness for maximum wear. Gage probes are calibrated to dimensions and tolerances as specified and are traceable to the National Institute of Standards and Technology.

# #3230 HEXAGON PUNCHES

ANSI/ASME 18.3 1986

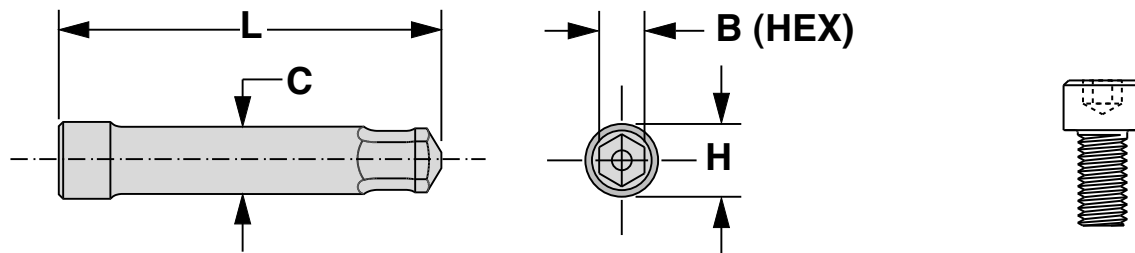


PART NUMBER	SCREW SIZE	B (HEX) inch / mm	C inch / mm	H inch / mm	L inch / mm
3230-02	#2 & #3	.0791 / 2,009	.1255 / 3,19	.187 / 4,75	1.020 / 25,91
3230-04	#4 & #5	.0952 / 2,418	.1255 / 3,19	.187 / 4,75	1.020 / 25,91
3230-06	#6	.1111 / 2,822	.1405 / 3,57	.218 / 5,54	1.020 / 25,91
3230-08	#8	.1426 / 3,622	.1760 / 4,47	.218 / 5,54	1.020 / 25,91
3230-10	#10	.1587 / 4,031	.1940 / 4,93	.250 / 6,35	1.020 / 25,91
3230-25	1/4"	.1900 / 4,826	.2290 / 5,82	.281 / 7,14	1.375 / 34,92
3230-31	5/16"	.2530 / 6,426	.3020 / 7,67	.343 / 8,71	1.375 / 34,92
3230-37	3/8"	.3160 / 8,026	.3775 / 9,59	.437 / 11,10	1.375 / 34,92
3230-50	7/16" & 1/2"	.3790 / 9,627	.4500 / 11,43	.500 / 12,70	1.500 / 38,10
3230-62	5/8"	.5050 / 12,827	.6000 / 15,24	.656 / 16,66	2.500 / 63,50
3230-75	3/4"	.6310 / 16,027	.7500 / 19,05	.812 / 20,62	3.000 / 76,20

MATERIAL: ASP-30 SUPER HIGH SPEED STEEL  
HARDNESS: RC 65-66 TRIPLE DRAWN  
COATINGS: CVD AVAILABLE UPON REQUEST.

# #3231 METRIC HEXAGON PUNCHES

ISO 4762 / DIN 912 / ANSI B18.3 / JIS B1176

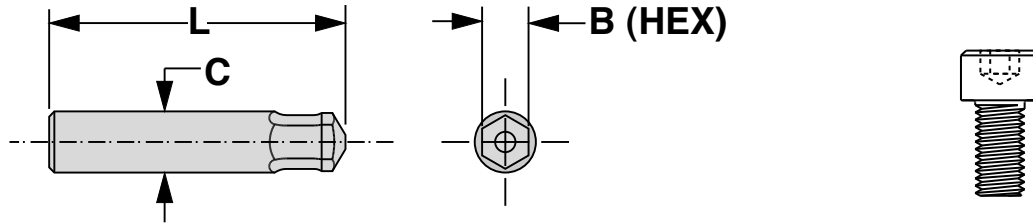


PART NUMBER	SCREW SIZE	B (HEX) inch / mm	C inch / mm	H inch / mm	L inch / mm
3231-03	M3	.1016 / 2,580	.1966 / 4,99	.256 / 6,50	1.730 / 44
3231-04	M4	.1213 / 3,080	.1966 / 4,99	.256 / 6,50	1.730 / 44
3231-05	M5	.1612 / 4,094	.2163 / 5,49	.276 / 7,01	2.283 / 58
3231-06	M6	.2024 / 5,140	.2594 / 6,59	.319 / 8,10	2.283 / 58
3231-08	M8	.2417 / 6,140	.3145 / 7,99	.374 / 9,50	2.283 / 58
3231-10	M10	.3219 / 8,175	.3932 / 9,99	.453 / 11,51	3.150 / 80
3231-12	M12	.4006 / 10,175	.4915 / 12,48	.551 / 14,00	3.150 / 80
3231-14	M14	.4808 / 12,212	.5899 / 14,98	.650 / 16,51	3.543 / 90
3231-16	M16-M18	.5595 / 14,211	.6686 / 16,98	.728 / 18,49	3.543 / 90
3231-20	M20-M22	.6783 / 17,230	.8260 / 20,98	.925 / 23,50	3.937 / 100
3231-24	M24-M27	.7589 / 19,275	.9055 / 23,00	.965 / 24,50	6.024 / 153

MATERIAL: ASP-30 SUPER HIGH SPEED STEEL  
HARDNESS: RC 65-66 TRIPLE DRAWN  
COATINGS: CVD AVAILABLE UPON REQUEST.

# #3232 METRIC HEXAGON PUNCHES

ISO 4762 / DIN 912 / ANSI B18.3 / JIS B1176

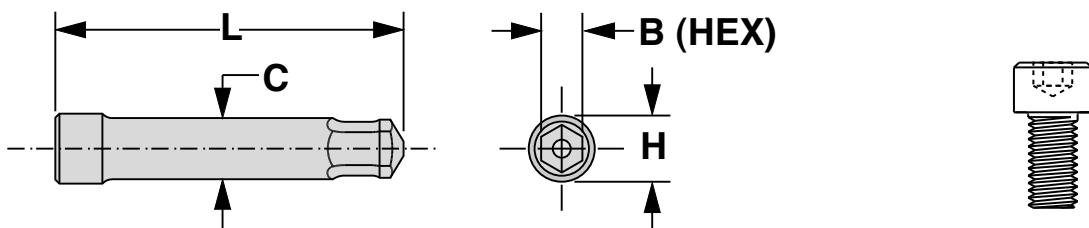


PART NUMBER	SCREW SIZE	HEX SIZE	B (HEX)		C		L	
			inch	mm	inch	mm	inch	mm
3232-03	M3	2,5	.1016	2,580	.1966	4,99	1.417	36
3232-04	M4	3	.1213	3,080	.1966	4,99	1.417	36
3232-05	M5	4	.1612	4,095	.2362	6,00	1.417	36
3232-06	M6	5	.2024	5,140	.2754	6,99	1.417	36
3232-08	M8	6	.2417	6,140	.2950	7,49	1.417	36
3232-10	M10	8	.3219	8,175	.3937	10,00	1.417	36
3232-12	M12	10	.4006	10,175	.4724	12,00	1.417	36
3232-14	M14	12	.4808	12,212	.5704	14,48	1.850	47
3232-16	M16-M18	14	.5595	14,212	.6686	16,98	1.850	47
3232-20	M20-M22	17	.6783	17,230	.8260	20,98	2.165	55
3232-24	M24-M27	19	.7589	19,275	.9048	22,98	2.362	60

MATERIAL: ASP-30 SUPER HIGH SPEED STEEL  
HARDNESS: RC 65-66 TRIPLE DRAWN  
COATINGS: CVD AVAILABLE UPON REQUEST.

# #3235 METRIC HEXAGON PUNCHES

ISO 4762 / DIN 912 / ANSI B18.3 / JIS B1176

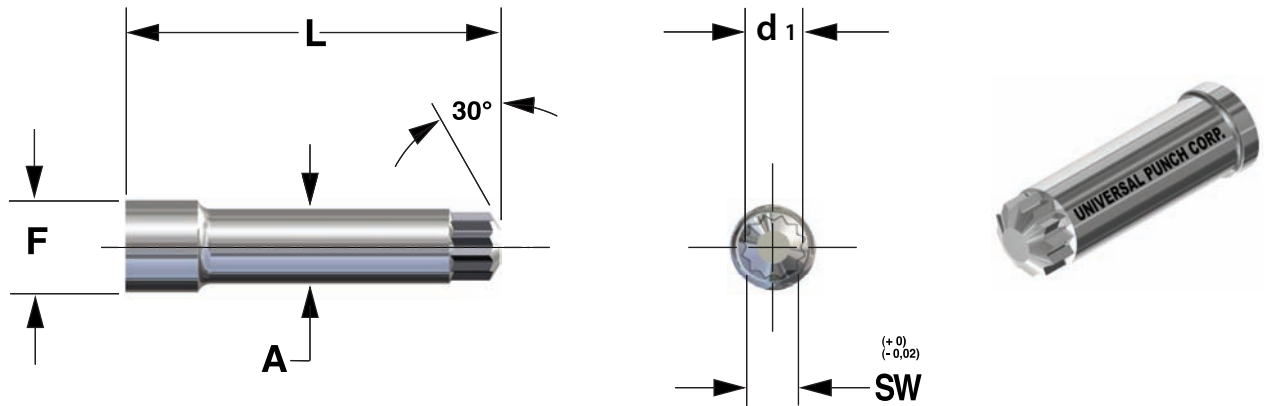


PART NUMBER	SCREW SIZE	B (HEX)		C		H		L	
		inch	mm	inch	mm	inch	mm	inch	mm
3235-03	M3	.1016	2,580	.1378	3,50	.197	5,00	1.024	26
3235-04	M4	.1213	3,080	.1575	4,00	.217	5,51	1.024	26
3235-05	M5	.1612	4,095	.2028	5,15	.260	6,60	1.181	30
3235-06	M6	.2024	5,140	.2500	6,35	.312	7,93	1.417	36
3235-08	M8	.2417	6,140	.2953	7,50	.354	8,98	1.417	36
3235-10	M10	.3219	8,175	.3878	9,85	.445	11,30	1.417	36
3235-12	M12	.4006	10,175	.4783	12,15	.539	13,69	1.575	40
3235-14	M14	.4808	12,212	.5709	14,50	.630	16,00	1.969	50
3235-16	M16	.5595	14,211	.6614	16,80	.728	18,49	2.362	60
3235-20	M20	.6783	17,250	.7972	20,25	.866	22,00	2.953	75
3235-24	M24	.7589	19,275	.9055	23,00	.965	24,50	3.150	80

MATERIAL: ASP-30 HIGH SPEED STEEL  
HARDNESS: RC 65-66 TRIPLE DRAWN  
COATINGS: CVD AVAILABLE UPON REQUEST.

# #3700 TWELVE-POINT PUNCHES

European Automotive Standards

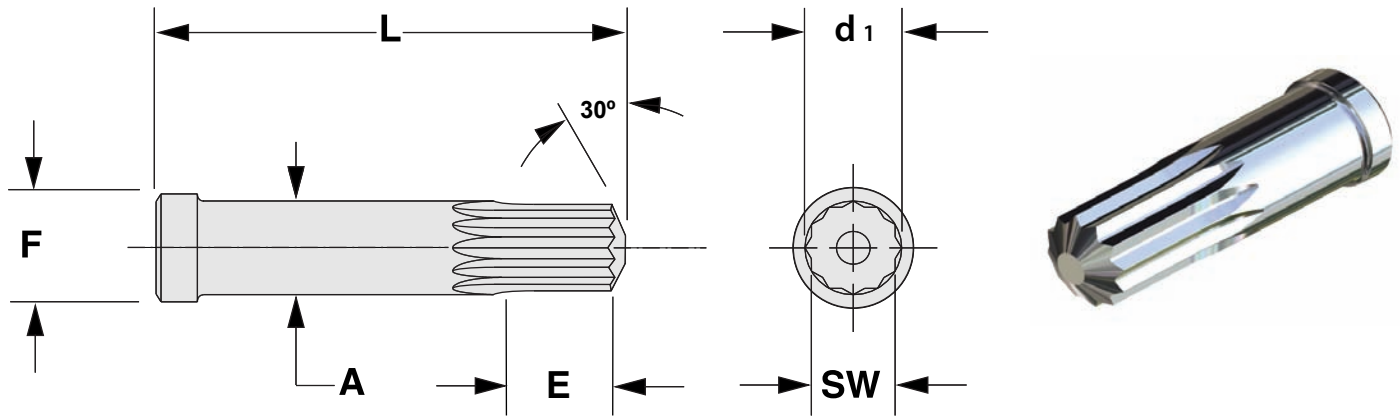


PART NUMBER	SCREW SIZE	SW	A	d1	F	L
		inch / mm	inch / mm	inch / mm	inch / mm	inch / mm
3800-04	M4	.1060 / 2,692	.1575 / 4,00	.146 / 3,72	.217 / 5,50	1.427 / 36
3800-05	M5	.1396 / 3,546	.2076 / 5,28	.194 / 4,94	.256 / 6,50	1.427 / 36
3800-06	M6	.1745 / 4,432	.2559 / 6,50	.242 / 6,17	.315 / 8,00	1.427 / 36
3800-08	M8	.2094 / 5,318	.3149 / 8,00	.291 / 7,40	.394 / 10,00	1.742 / 44
3800-10	M10	.2810 / 7,137	.3937 / 10,00	.387 / 9,84	.472 / 12,00	1.742 / 44
3800-12	M12	.3315 / 8,420	.5121 / 13,00	.460 / 11,70	.571 / 14,50	2.411 / 61
3800-14	M14	.3807 / 9,670	.5503 / 13,97	.533 / 13,54	.630 / 16,00	2.411 / 61
3800-16	M16	.4468 / 11,350	.6500 / 16,50	.629 / 15,99	.728 / 18,50	2.411 / 61
3800-18	M18	.4821 / 12,245	.7087 / 18,00	.677 / 17,22	.787 / 20,00	2.411 / 61

MATERIAL: M-2 HIGH SPEED STEEL, HARDNESS: RC 62-64  
 MATERIAL: M-42 HIGH SPEED STEEL, HARDNESS: RC 64-66  
 SURFACE FINISHES: 16 RMS (EXTRUSION ANGLE)  
 TOLERANCE: CONCENTRICITY OF FORM .001/0,025MM  
 COATINGS: CVD AVAILABLE UPON REQUEST.

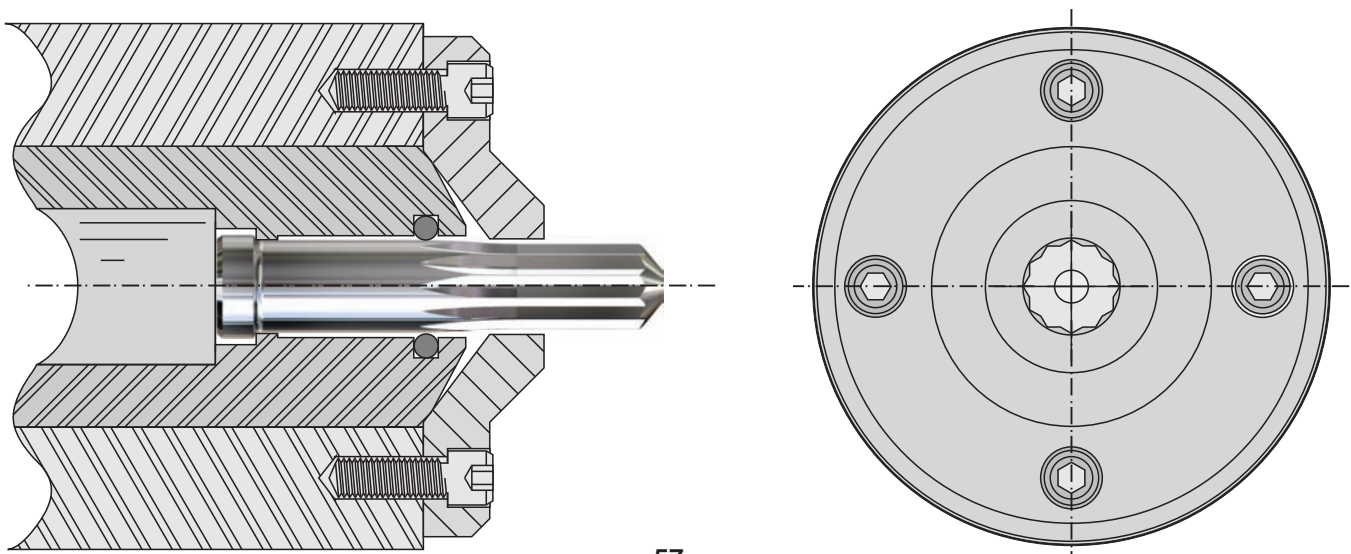
# #3800 TWELVE-POINT PUNCHES

European Automotive Standards



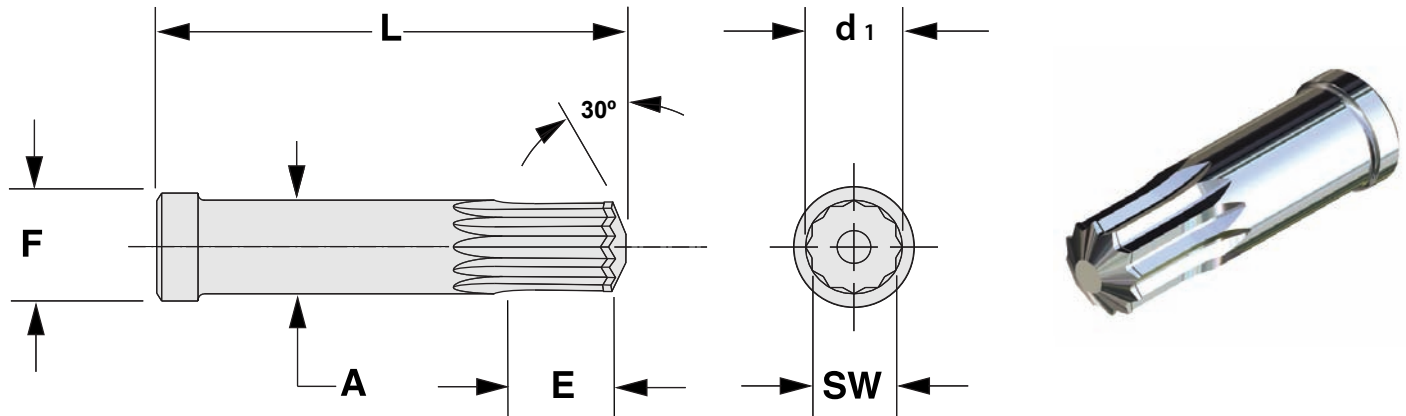
PART NUMBER	SCREW SIZE	SW inch / mm	A inch / mm	d1 inch / mm	E inch / mm	F inch / mm	L inch / mm
3800-04	M4	.1060 / 2,692	.1575 / 4,00	.146 / 3,72	.197 / 5,00	.217 / 5,50	1.427 / 36
3800-05	M5	.1396 / 3,546	.2076 / 5,28	.194 / 4,94	.236 / 6,00	.256 / 6,50	1.427 / 36
3800-06	M6	.1745 / 4,432	.2559 / 6,50	.242 / 6,17	.276 / 8,00	.315 / 8,00	1.427 / 36
3800-08	M8	.2094 / 5,318	.3149 / 8,00	.291 / 7,40	.315 / 10,00	.394 / 10,00	1.742 / 44
3800-10	M10	.2810 / 7,137	.3937 / 10,00	.387 / 9,84	.394 / 12,00	.472 / 12,00	1.742 / 44
3800-12	M12	.3315 / 8,420	.5121 / 13,00	.460 / 11,70	.433 / 14,00	.571 / 14,50	2.411 / 61
3800-14	M14	.3807 / 9,670	.5503 / 13,97	.533 / 13,54	.551 / 16,00	.630 / 16,00	2.411 / 61
3800-16	M16	.4468 / 11,350	.6500 / 16,50	.629 / 15,99	.670 / 18,50	.728 / 18,50	2.411 / 61
3800-18	M18	.4821 / 12,245	.7087 / 18,00	.677 / 17,22	.787 / 20,00	.787 / 20,00	2.411 / 61

MATERIAL: ASP-30 HIGH SPEED STEEL, HARDNESS: RC 64-66  
 SURFACE FINISHES: 16 RMS (EXTRUSION ANGLE)  
 TOLERANCE: CONCENTRICITY OF FORM .001/0,025MM  
 COATINGS: CVD AVAILABLE UPON REQUEST.



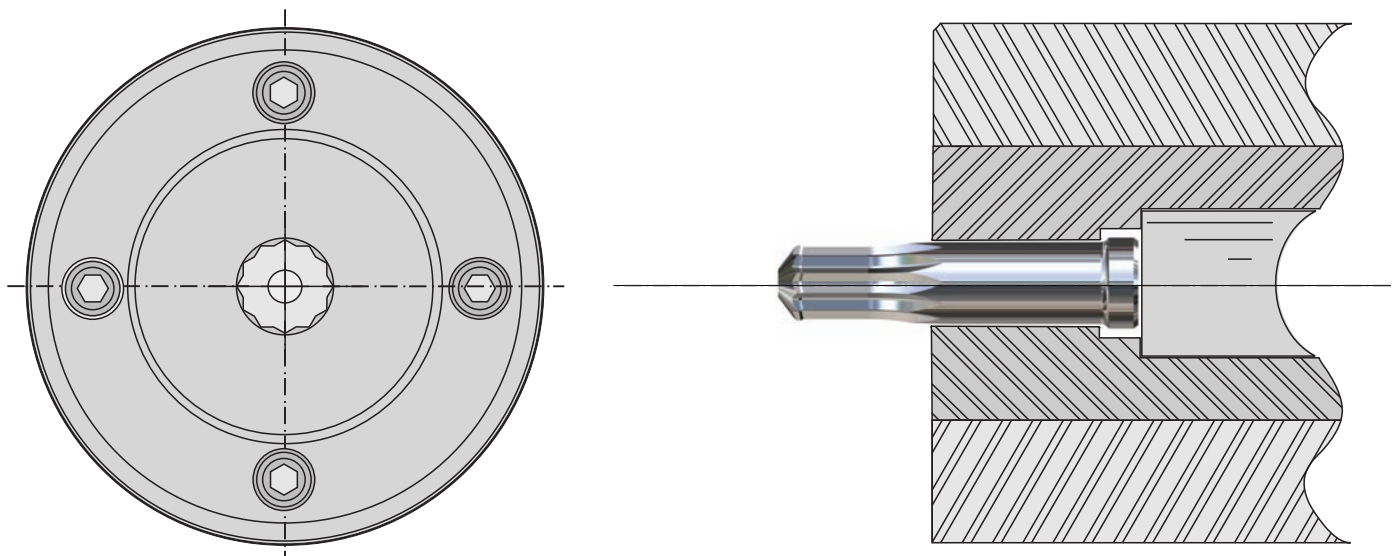
# #3805 TWELVE-POINT PUNCHES

European Automotive Standards



PART NUMBER	SCREW SIZE	SW inch / mm	A inch / mm	d1 inch / mm	E inch / mm	F inch / mm	L inch / mm
3805-04	M4	.1060 / 2,692	.1575 / 4,00	.146 / 3,72	.197 / 5,00	.217 / 5,50	1.427 / 36
3805-05	M5	.1396 / 3,546	.2076 / 5,28	.194 / 4,94	.236 / 6,00	.256 / 6,50	1.427 / 36
3805-06	M6	.1745 / 4,432	.2559 / 6,50	.242 / 6,17	.276 / 8,00	.315 / 8,00	1.427 / 36
3805-08	M8	.2094 / 5,318	.3149 / 8,00	.291 / 7,40	.315 / 10,00	.394 / 10,00	1.742 / 44
3805-10	M10	.2810 / 7,137	.3937 / 10,00	.387 / 9,84	.394 / 12,00	.472 / 12,00	1.742 / 44
3805-12	M12	.3315 / 8,420	.5121 / 13,00	.460 / 11,70	.433 / 14,00	.571 / 14,50	2.411 / 61
3805-14	M14	.3807 / 9,670	.5503 / 13,97	.533 / 13,54	.551 / 16,00	.630 / 16,00	2.411 / 61
3805-16	M16	.4468 / 11,350	.6500 / 16,50	.629 / 15,99	.670 / 18,50	.728 / 18,50	2.411 / 61
3805-18	M18	.4821 / 12,245	.7087 / 18,00	.677 / 17,22	.787 / 20,00	.787 / 20,00	2.411 / 61

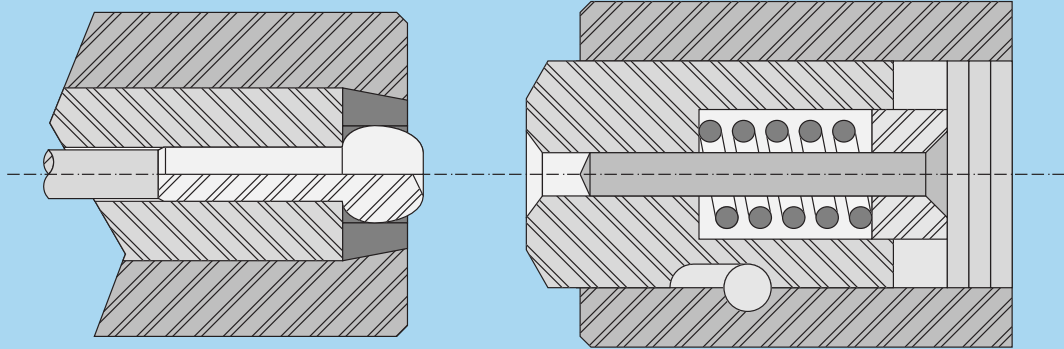
MATERIAL: ASP-30 HIGH SPEED STEEL, HARDNESS: RC 64-66  
 SURFACE FINISHES: 16 RMS (EXTRUSION ANGLE AND LAND)  
 TOLERANCE: CONCENTRICITY OF FORM .001/0,025MM  
 COATINGS: CVD AVAILABLE UPON REQUEST.



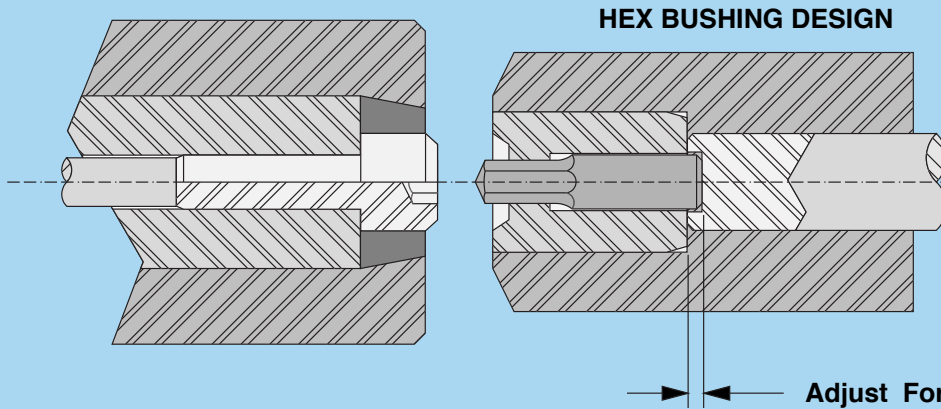


# HEXAGON PUNCH & INSERT ASSEMBLY

## 1st UPSET BLOW



## 2nd FINISHING BLOW



### HEX BUSHING DESIGN

#### HEX INSERTS

4605 4611  
4606 4612  
4607 4613

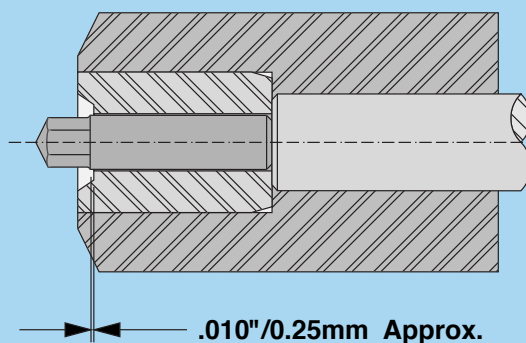
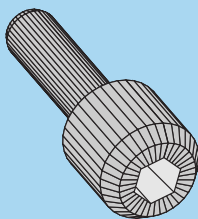
#### HEX PUNCHES

5605 5611  
5606 5612  
5607 5613

Adjust For Depth.

THIS DESIGN WILL ALLOW YOU TO REPOINT THE PUNCH NOSE TO PROVIDE ADDITIONAL LIFE.

### ROUND BUSHING DESIGN



#### HEX INSERTS

4602  
4603  
4604

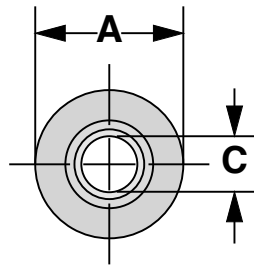
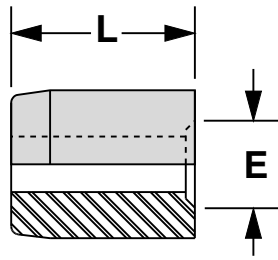
#### HEX PUNCHES

5602  
5603  
5604

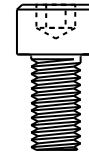
.010"/0.25mm Approx.

# #4602 HEXAGON INSERTS

ANSI 18.3 1986



ROUND BUSHING DESIGN  
SOCKET HEAD CAP SCREW

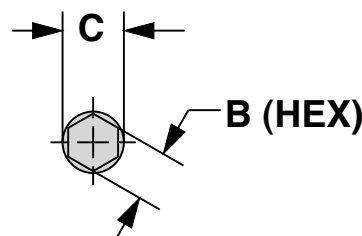
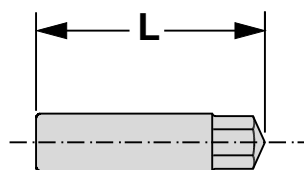


PART NUMBER	SCREW SIZE	A	C	E	L
		inch / mm	inch / mm	inch / mm	inch / mm
4602-01	#1	.563 / 14,29	.0783 / 1,989	.118 / 3,00	.500 / 12,70
4602-02	#2	.563 / 14,29	.0983 / 2,497	.140 / 3,56	.500 / 12,70
4602-03	#3	.563 / 14,29	.0983 / 2,497	.161 / 4,09	.500 / 12,70
4602-04	#4	.563 / 14,29	.1123 / 2,852	.183 / 4,65	.500 / 12,70
4602-05	#5	.563 / 14,29	.1123 / 2,852	.205 / 5,21	.500 / 12,70
4602-06	#6	.563 / 14,29	.1303 / 3,310	.226 / 5,74	.500 / 12,70
4602-08	#8	.563 / 14,29	.1683 / 4,275	.270 / 6,86	.500 / 12,70
4602-10	#10	.563 / 14,29	.1873 / 4,757	.312 / 7,92	.500 / 12,70
4602-25	1/4"	.875 / 22,23	.2213 / 5,621	.375 / 9,53	1.000 / 25,40
4602-31	5/16"	.875 / 22,23	.2963 / 7,526	.469 / 11,91	1.000 / 25,40
4602-37	3/8"	1.000 / 25,40	.3703 / 9,405	.562 / 14,27	1.000 / 25,40
4602-43	7/16"	1.250 / 31,75	.4453 / 11,310	.656 / 16,66	1.000 / 25,40
4602-50	1/2"	1.250 / 31,75	.4453 / 11,310	.750 / 19,05	1.000 / 25,40

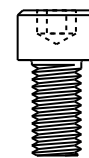
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #5602 HEXAGON PINS

ANSI 18.3 1986



ROUND BUSHING DESIGN  
SOCKET HEAD CAP SCREW



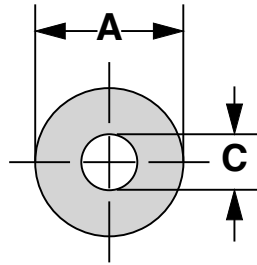
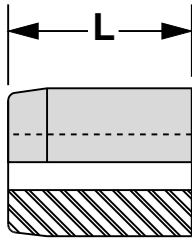
PART NUMBER	SCREW SIZE	B (HEX)	C	L
		inch / mm	inch / mm	inch / mm
5602-01	#1	.0633 / 1,608	.0783 / 1,989	.559 / 14,20
5602-02	#2	.0790 / 2,009	.0983 / 2,497	.570 / 14,48
5602-03	#3	.0790 / 2,009	.0983 / 2,497	.574 / 14,58
5602-04	#4	.0952 / 2,418	.1123 / 2,852	.592 / 15,04
5602-05	#5	.0952 / 2,418	.1123 / 2,852	.597 / 15,16
5602-06	#6	.1111 / 2,822	.1303 / 3,310	.608 / 15,44
5602-08	#8	.1424 / 3,617	.1683 / 4,275	.626 / 15,90
5602-10	#10	.1585 / 4,025	.1873 / 4,757	.648 / 16,46
5602-25	1/4"	.1897 / 4,818	.2215 / 5,626	1.182 / 30,02
5602-31	5/16"	.2527 / 6,418	.2965 / 7,531	1.228 / 31,19
5602-37	3/8"	.3157 / 8,018	.3705 / 9,411	1.278 / 32,46
5602-43	7/16"	.3787 / 9,619	.4455 / 11,316	1.323 / 33,60
5602-50	1/2"	.3787 / 9,619	.4455 / 11,316	1.352 / 34,34

MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 64-65

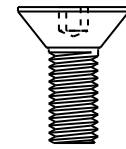
FOR STAINLESS STEEL SCREWS USE "SUPER SERIES"  
PUNCHES. MATERIAL: ASP-30, HARDNESS: RC 65-66

# #4603 HEXAGON INSERTS

ANSI 18.3 1986



ROUND BUSHING DESIGN  
FLAT HEAD SOCKET SCREW

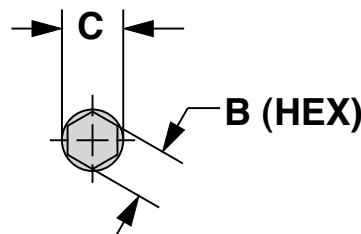
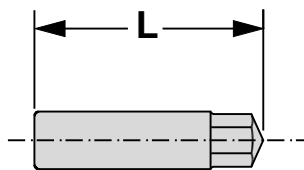


PART NUMBER	SCREW SIZE	A inch / mm	C inch / mm	L inch / mm
4603-01	#1 & #2	.563 / 14,29	.0623 / 1,582	.500 / 12,70
4603-03	#3 & #4	.563 / 14,29	.0783 / 1,989	.500 / 12,70
4603-05	#5 & #6	.563 / 14,29	.0953 / 2,421	.500 / 12,70
4603-08	#8	.563 / 14,29	.1123 / 2,852	.500 / 12,70
4603-10	#10	.563 / 14,29	.1503 / 3,817	.500 / 12,70
4603-25	1/4"	.875 / 22,23	.1873 / 4,757	1.000 / 25,40
4603-31	5/16"	.875 / 22,23	.2213 / 5,621	1.000 / 25,40
4603-37	3/8"	1.000 / 25,40	.2603 / 6,612	1.000 / 25,40
4603-43	7/16"	1.250 / 31,75	.2963 / 7,525	1.000 / 25,40
4603-50	1/2"	1.250 / 31,75	.3703 / 9,406	1.000 / 25,40

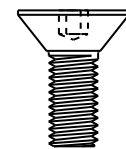
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #5603 HEXAGON PINS

ANSI 18.3 1986



ROUND BUSHING DESIGN  
FLAT HEAD SOCKET SCREW



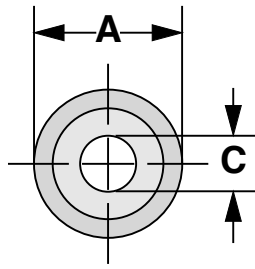
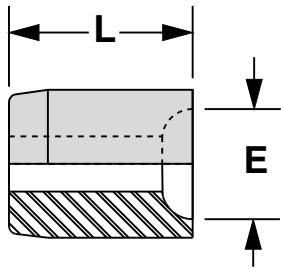
PART NUMBER	SCREW SIZE	B (HEX) inch / mm	C inch / mm	L inch / mm
5603-01	#1	.0510 / 1,295	.0623 / 1,582	.561 / 14,25
5603-02	#2	.0510 / 1,295	.0623 / 1,582	.568 / 14,43
5603-03	#3	.0633 / 1,608	.0783 / 1,989	.577 / 14,66
5603-04	#4	.0633 / 1,608	.0783 / 1,989	.589 / 14,96
5603-05	#5	.0790 / 2,007	.0953 / 2,421	.604 / 15,34
5603-06	#6	.0790 / 2,007	.0953 / 2,421	.609 / 15,47
5603-08	#8	.0952 / 2,418	.1123 / 2,852	.624 / 15,85
5603-10	#10	.1268 / 3,221	.1503 / 3,818	.643 / 16,33
5603-25	1/4"	.1585 / 4,026	.1873 / 4,757	1.176 / 29,87
5603-31	5/16"	.1897 / 4,818	.2215 / 5,626	1.208 / 30,68
5603-37	3/8"	.2215 / 5,626	.2605 / 6,617	1.241 / 31,52
5603-43	7/16"	.2527 / 6,419	.2965 / 7,531	1.249 / 31,72
5603-50	1/2"	.3157 / 8,019	.3705 / 9,411	1.279 / 32,49

MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 64-65

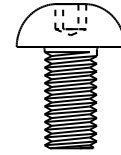
FOR STAINLESS STEEL SCREWS USE "SUPER SERIES"  
PUNCHES. MATERIAL: ASP-30, HARDNESS: RC 65-66

# #4604 HEXAGON INSERTS

ANSI 18.3 1986



ROUND BUSHING DESIGN  
BUTTON HEAD SOCKET SCREW

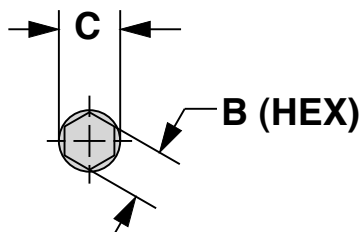
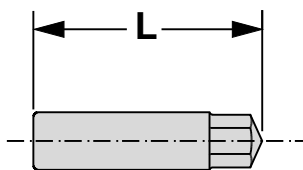


PART NUMBER	SCREW SIZE	A	C	E	L
		inch / mm	inch / mm	inch / mm	inch / mm
4604-01	#1	.563 / 14,29	.0623 / 1,582	.149 / 3,78	.500 / 12,70
4604-02	#2	.563 / 14,29	.0623 / 1,582	.174 / 4,42	.500 / 12,70
4604-03	#3	.563 / 14,29	.0783 / 1,989	.198 / 5,03	.500 / 12,70
4604-04	#4	.563 / 14,29	.0783 / 1,989	.223 / 5,66	.500 / 12,70
4604-05	#5	.563 / 14,29	.0953 / 2,421	.248 / 6,30	.500 / 12,70
4604-06	#6	.563 / 14,29	.0953 / 2,421	.272 / 6,91	.500 / 12,70
4604-08	#8	.563 / 14,29	.1123 / 2,852	.322 / 8,18	.500 / 12,70
4604-10	#10	.563 / 14,29	.1503 / 3,818	.371 / 9,42	.500 / 12,70
4604-25	1/4"	.875 / 22,23	.1873 / 4,757	.447 / 11,35	1.000 / 25,40
4604-31	5/16"	.875 / 22,23	.2213 / 5,621	.557 / 14,15	1.000 / 25,40
4604-37	3/8"	1.250 / 31,75	.2603 / 6,612	.666 / 16,92	1.000 / 25,40
4604-50	1/2"	1.250 / 31,75	.3713 / 9,431	.890 / 22,61	1.000 / 25,40

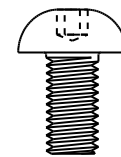
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #5604 HEXAGON PINS

ANSI 18.3 1986



ROUND BUSHING DESIGN  
BUTTON HEAD SOCKET SCREW



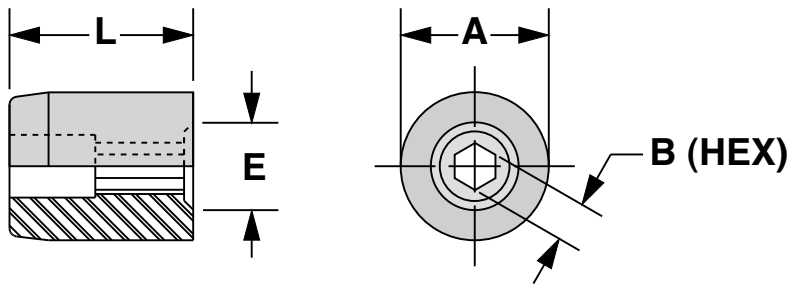
PART NUMBER	SCREW SIZE	B (HEX)	C	L
		inch / mm	inch / mm	inch / mm
5604-01	#1	.0510 / 1,295	.0623 / 1,582	.519 / 13,18
5604-02	#2	.0510 / 1,295	.0623 / 1,582	.514 / 13,05
5604-03	#3	.0633 / 1,608	.0783 / 1,989	.518 / 13,15
5604-04	#4	.0633 / 1,608	.0783 / 1,989	.511 / 12,97
5604-05	#5	.0790 / 2,007	.0953 / 2,421	.522 / 13,25
5604-06	#6	.0790 / 2,007	.0953 / 2,421	.517 / 13,13
5604-08	#8	.0952 / 2,418	.1123 / 2,852	.521 / 13,23
5604-10	#10	.1268 / 3,221	.1503 / 3,818	.534 / 13,56
5604-25	1/4"	.1585 / 4,026	.1873 / 4,757	1.029 / 26,13
5604-31	5/16"	.1897 / 4,818	.2215 / 5,626	1.025 / 26,03
5604-37	3/8"	.2215 / 5,626	.2605 / 6,617	1.018 / 25,85
5604-50	1/2"	.3157 / 8,019	.3715 / 9,436	1.041 / 26,44

MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 64-65

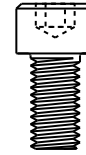
FOR STAINLESS STEEL SCREWS USE "SUPER SERIES"  
PUNCHES. MATERIAL: ASP-30, HARDNESS: RC 65-66

# #4605 HEXAGON INSERTS

ANSI 18.3 1986



HEX BUSHING DESIGN  
SOCKET HEAD CAP SCREW

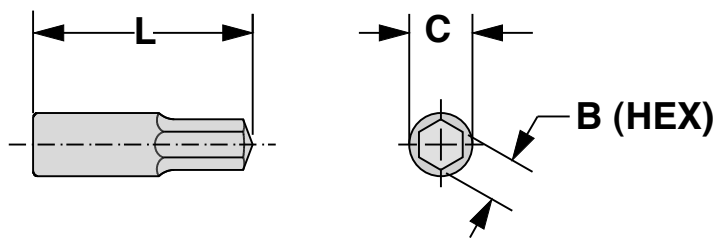


PART NUMBER	SCREW SIZE	A inch / mm	B inch / mm	E inch / mm	L inch / mm
4605-01	#1	.563 / 14,29	.0635 / 1,613	.118 / 3,00	.500 / 12,70
4605-02	#2	.563 / 14,29	.0791 / 2,009	.140 / 3,56	.500 / 12,70
4605-03	#3	.563 / 14,29	.0791 / 2,009	.161 / 4,09	.500 / 12,70
4605-04	#4	.563 / 14,29	.0952 / 2,418	.183 / 4,65	.500 / 12,70
4605-05	#5	.563 / 14,29	.0952 / 2,418	.205 / 5,21	.500 / 12,70
4605-06	#6	.563 / 14,29	.1111 / 2,822	.226 / 5,74	.500 / 12,70
4605-08	#8	.563 / 14,29	.1426 / 3,622	.270 / 6,86	.500 / 12,70
4605-10	#10	.563 / 14,29	.1587 / 4,031	.312 / 7,92	.500 / 12,70
4605-25	1/4"	.875 / 22,23	.1900 / 4,826	.375 / 9,53	1.000 / 25,40
4605-31	5/16"	.875 / 22,23	.2530 / 6,426	.469 / 11,91	1.000 / 25,40
4605-37	3/8"	1.000 / 25,40	.3160 / 8,026	.562 / 14,27	1.000 / 25,40
4605-43	7/16"	1.250 / 31,75	.3790 / 9,627	.656 / 16,66	1.000 / 25,40
4605-50	1/2"	1.250 / 31,75	.3790 / 9,627	.750 / 19,05	1.000 / 25,40
4605-62	5/8"	1.375 / 34,93	.5050 / 12,827	.938 / 23,83	1.000 / 25,40
4605-75	3/4"	1.500 / 38,10	.6310 / 16,027	1.125 / 28,57	1.000 / 25,40

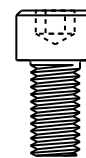
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #5605 HEXAGON PINS

ANSI 18.3 1986



HEX BUSHING DESIGN  
SOCKET HEAD CAP SCREW



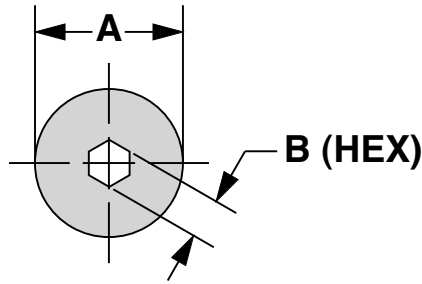
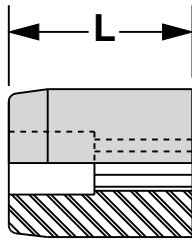
PART NUMBER	SCREW SIZE	B (HEX) inch / mm	C inch / mm	L inch / mm
5605-01	#1	.0635 / 1,613	.078 / 1,98	.602 / 15,29
5605-02	#2 & #3	.0791 / 2,009	.095 / 2,41	.617 / 15,67
5605-04	#4 & #5	.0952 / 2,418	.112 / 2,84	.632 / 16,05
5605-06	#6	.1111 / 2,822	.130 / 3,30	.617 / 15,67
5605-08	#8	.1426 / 3,622	.168 / 4,27	.635 / 16,12
5605-10	#10	.1587 / 4,031	.187 / 4,75	.652 / 16,56
5605-25	1/4"	.1900 / 4,826	.221 / 5,61	1.216 / 30,89
5605-31	5/16"	.2530 / 6,426	.296 / 7,52	1.257 / 31,93
5605-37	3/8"	.3160 / 8,026	.370 / 9,40	1.287 / 32,69
5605-43	7/16"	.3790 / 9,627	.445 / 11,30	1.322 / 33,58
5605-50	1/2"	.3790 / 9,627	.445 / 11,30	1.351 / 34,32
5605-62	5/8"	.5050 / 12,827	.590 / 14,99	1.443 / 36,65
5605-75	3/4"	.6310 / 16,027	.735 / 18,67	1.535 / 38,99

MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 64-65

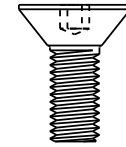
FOR STAINLESS STEEL SCREWS USE "SUPER SERIES"  
PUNCHES. MATERIAL: ASP-30, HARDNESS: RC 65-66

# #4606 HEXAGON INSERTS

ANSI 18.3 1986



HEX BUSHING DESIGN  
FLAT HEAD SOCKET SCREW

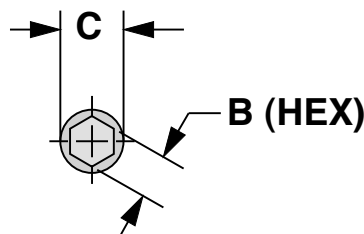
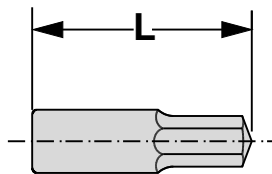


PART NUMBER	SCREW SIZE	A		B		L	
		inch	mm	inch	mm	inch	mm
4606-01	#1 & #2	.563	14,29	.0510	1,295	.500	12,70
4606-03	#3 & #4	.563	14,29	.0635	1,613	.500	12,70
4606-05	#5 & #6	.563	14,29	.0791	2,009	.500	12,70
4606-08	#8	.563	14,29	.0952	2,418	.500	12,70
4606-10	#10	.563	14,29	.1270	3,226	.500	12,70
4606-25	1/4"	.875	22,23	.1587	4,031	1.000	25,40
4606-31	5/16"	.875	22,23	.1900	4,826	1.000	25,40
4606-37	3/8"	1.000	25,40	.2217	5,631	1.000	25,40
4606-43	7/16"	1.250	31,75	.2530	6,426	1.000	25,40
4606-50	1/2"	1.250	31,75	.3160	8,026	1.000	25,40
4606-62	5/8"	1.375	34,93	.3790	9,627	1.000	25,40
4606-75	3/4"	1.500	38,10	.5050	12,827	1.000	25,40

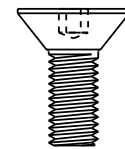
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #5606 HEXAGON PINS

ANSI 18.3 1986



HEX BUSHING DESIGN  
FLAT HEAD SOCKET SCREW



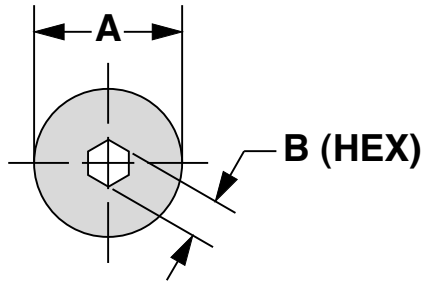
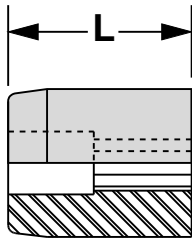
PART NUMBER	SCREW SIZE	B		C		L		Substitute Punch
		inch	mm	inch	mm	inch	mm	
5606-01	#1 & #2	.0510	1,295	.062	1,57	.582	14,78	None
5606-03	#3 & #4	.0635	1,613	.078	1,98	.602	15,29	Part No. 5605-01
5606-05	#5 & #6	.0791	2,009	.095	2,43	.617	15,67	Part No. 5605-02
5606-08	#8	.0952	2,418	.112	2,86	.632	16,05	Part No. 5605-04
5606-10	#10	.1270	3,226	.150	3,82	.651	16,54	None
5606-25	1/4"	.1587	4,031	.187	4,75	1.184	30,07	None
5606-31	5/16"	.1900	4,826	.221	5,63	1.216	30,89	Part No. 5605-25
5606-37	3/8"	.2217	5,631	.260	6,62	1.249	31,72	None
5606-43	7/16"	.2530	6,426	.296	7,52	1.257	31,93	Part No. 5605-31
5606-50	1/2"	.3160	8,026	.370	9,40	1.287	32,69	Part No. 5605-37
5606-62	5/8"	.3790	9,627	.445	11,30	1.352	34,34	Part No. 5605-50
5606-75	3/4"	.5050	12,827	.590	14,99	1.443	36,65	Part No. 5605-62

MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 64-65

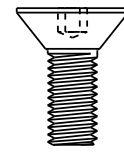
FOR STAINLESS STEEL SCREWS USE "SUPER SERIES"  
PUNCHES. MATERIAL: ASP-30, HARDNESS: RC 65-66

# #4607 METRIC HEXAGON INSERTS

ISO10642 DIN7991 & ANSI B18.3.5M



HEX BUSHING DESIGN  
FLAT HEAD SOCKET SCREW

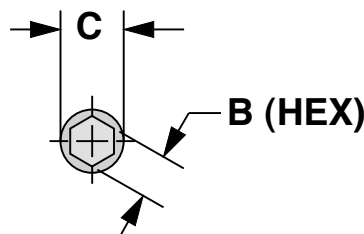
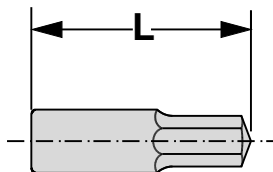


PART NUMBER	SCREW SIZE	A inch / mm	B inch / mm	L inch / mm
4607-03	M3	.563 / 14,29	.0827 / 2,10	.630 / 16,00
4607-04	M4	.563 / 14,29	.1024 / 2,60	.630 / 16,00
4607-05	M5	.563 / 14,29	.1220 / 3,10	.630 / 16,00
4607-06	M6	.875 / 22,23	.1622 / 4,12	.787 / 19,99
4607-08	M8	.875 / 22,23	.2024 / 5,14	.787 / 19,99
4607-10	M10	1.000 / 25,40	.2417 / 6,14	1.000 / 25,40
4607-12	M12	1.250 / 31,75	.3219 / 8,175	1.000 / 25,40
4607-14	M14	1.250 / 31,75	.4006 / 10,175	1.000 / 25,40
4607-16	M16	1.500 / 38,10	.4006 / 10,175	1.000 / 25,40

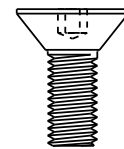
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #5607 METRIC HEXAGON PINS

ISO10642 DIN7991 & ANSI B18.3.5M



HEX BUSHING DESIGN  
FLAT HEAD SOCKET SCREW



PART NUMBER	SCREW SIZE	B inch / mm	C inch / mm	L inch / mm
5607-03	M3	.0827 / 2,10	.112 / 2,85	.741 / 18,82
5607-04	M4	.1024 / 2,60	.129 / 3,29	.764 / 19,41
5607-05	M5	.1220 / 3,10	.149 / 3,80	.782 / 19,86
5607-06	M6	.1622 / 4,12	.220 / 5,61	1.009 / 25,63
5607-08	M8	.2024 / 5,14	.250 / 6,35	1.019 / 25,88
5607-10	M10	.2417 / 6,14	.296 / 7,51	1.278 / 32,46
5607-12	M12	.3219 / 8,18	.390 / 9,91	1.306 / 33,17
5607-14	M14	.4006 / 10,17	.479 / 12,18	1.355 / 34,42
5607-16	M16	.4006 / 10,17	.479 / 12,18	1.355 / 34,42

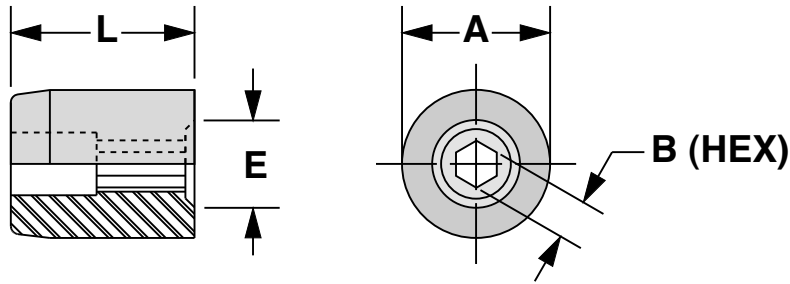
MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 64-65

FOR STAINLESS STEEL SCREWS USE "SUPER SERIES"  
PUNCHES. MATERIAL: ASP-30, HARDNESS: RC 65-66

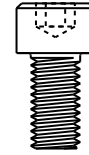


# #4611 METRIC HEXAGON INSERTS

ISO4762 & ANSI B18.3.5M



HEX BUSHING DESIGN  
SOCKET HEAD CAP SCREW

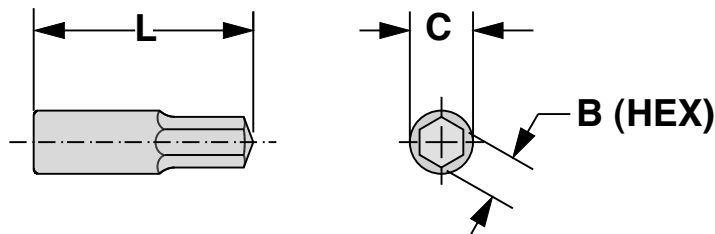


PART NUMBER	SCREW SIZE	A	B	E	L
		inch / mm	inch / mm	inch / mm	inch / mm
4611-03	M3	.563 / 14,29	.1008 / 2,560	.216 / 5,49	.630 / 16,00
4611-04	M4	.563 / 14,29	.1209 / 3,071	.275 / 6,98	.630 / 16,00
4611-05	M5	.875 / 22,23	.1608 / 4,084	.334 / 8,48	.787 / 19,99
4611-06	M6	.875 / 22,23	.2002 / 5,084	.394 / 10,01	.787 / 19,99
4611-08	M8	.875 / 22,23	.2400 / 6,095	.512 / 13,00	.787 / 19,99
4611-10	M10	1.250 / 31,75	.3195 / 8,115	.630 / 16,00	1.000 / 25,40
4611-12	M12	1.250 / 31,75	.3987 / 10,127	.708 / 17,98	1.000 / 25,40
4611-14	M14	1.375 / 34,93	.4782 / 12,146	.826 / 20,98	1.000 / 25,40
4611-16	M16	1.375 / 34,93	.5574 / 14,159	.944 / 23,98	1.000 / 25,40

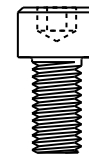
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #5611 METRIC HEXAGON PINS

ISO4762 & ANSI B18.3.5M



HEX BUSHING DESIGN  
SOCKET HEAD CAP SCREW



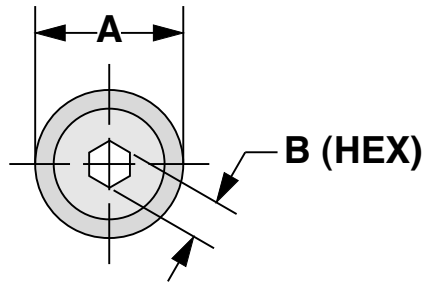
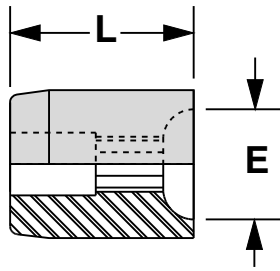
PART NUMBER	SCREW SIZE	B	C	L
		inch / mm	inch / mm	inch / mm
5611-03	M3	.1008 / 2,560	.129 / 3,29	.738 / 18,75
5611-04	M4	.1209 / 3,071	.149 / 3,80	.760 / 19,30
5611-05	M5	.1608 / 4,084	.220 / 5,61	.953 / 24,21
5611-06	M6	.2002 / 5,084	.250 / 6,35	.967 / 24,56
5611-08	M8	.2400 / 6,095	.296 / 7,51	1.020 / 25,91
5611-10	M10	.3195 / 8,115	.390 / 9,91	1.292 / 32,82
5611-12	M12	.3987 / 10,127	.479 / 12,18	1.344 / 34,14
5611-14	M14	.4782 / 12,146	.572 / 14,52	1.386 / 35,20
5611-16	M16	.5574 / 14,159	.663 / 16,84	1.471 / 37,36

MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 64-65

FOR STAINLESS STEEL SCREWS USE "SUPER SERIES"  
PUNCHES. MATERIAL: ASP-30, HARDNESS: RC 65-66

# #4612 METRIC HEXAGON INSERTS

ISO7380 & ANSI B18.3.4



HEX BUSHING DESIGN  
BUTTON HEAD SOCKET SCREW

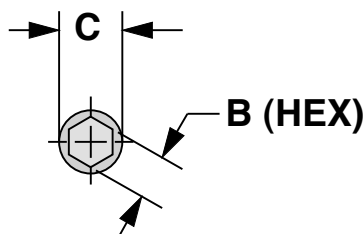
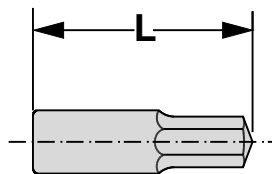


PART NUMBER	SCREW SIZE	A inch / mm	B inch / mm	E inch / mm	L inch / mm
4612-03	M3	.563 / 14,29	.0803 / 2,040	.231 / 5,87	.630 / 16,00
4612-04	M4	.563 / 14,29	.1006 / 2,555	.308 / 7,83	.630 / 16,00
4612-05	M5	.875 / 22,23	.1211 / 3,075	.385 / 9,78	.787 / 19,99
4612-06	M6	.875 / 22,23	.1610 / 4,090	.426 / 10,81	.787 / 19,99
4612-08	M8	1.000 / 25,40	.2004 / 5,090	.568 / 14,42	.787 / 19,99
4612-10	M10	1.250 / 31,75	.2398 / 6,090	.710 / 18,02	1.000 / 25,40
4612-12	M12	1.375 / 34,93	.3193 / 8,110	.852 / 21,63	1.000 / 25,40
4612-16	M16	1.500 / 38,10	.3980 / 10,110	1.135 / 28,84	1.250 / 31,75

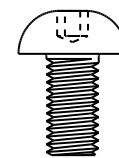
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #5612 METRIC HEXAGON PINS

ISO7380 & ANSI B18.3.4



HEX BUSHING DESIGN  
BUTTON HEAD SOCKET SCREW



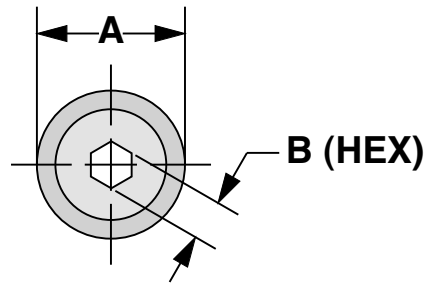
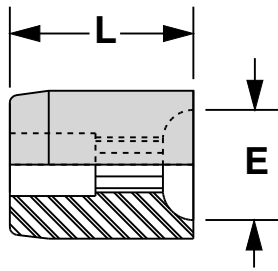
PART NUMBER	SCREW SIZE	B inch / mm	C inch / mm	L inch / mm
5612-03	M3	.0803 / 2,040	.112 / 2,85	.674 / 17,12
5612-04	M4	.1006 / 2,555	.129 / 3,30	.671 / 17,04
5612-05	M5	.1211 / 3,075	.149 / 3,81	.824 / 20,93
5612-06	M6	.1610 / 4,090	.220 / 5,61	.837 / 21,26
5612-08	M8	.2004 / 5,090	.250 / 6,35	.831 / 21,10
5612-10	M10	.2398 / 6,090	.296 / 7,52	1.034 / 26,26
5612-12	M12	.3193 / 8,110	.390 / 9,91	1.060 / 26,92
5612-16	M16	.3980 / 10,110	.479 / 12,19	1.294 / 32,86

MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 64-65

FOR STAINLESS STEEL SCREWS USE "SUPER SERIES"  
PUNCHES. MATERIAL: ASP-30, HARDNESS: RC 65-66

# #4613 HEXAGON INSERTS

ANSI B18.3 1986



HEX BUSHING DESIGN  
BUTTON HEAD CAP SCREW

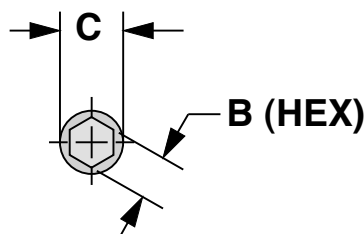
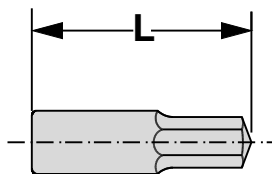


PART NUMBER	SCREW SIZE	A inch / mm	B inch / mm	E inch / mm	L inch / mm
4613-01	#1	.563 / 14,29	.0508 / 1,290	.149 / 3,78	.500 / 12,70
4613-02	#2	.563 / 14,29	.0508 / 1,290	.174 / 4,42	.500 / 12,70
4613-03	#3	.563 / 14,29	.0633 / 1,608	.198 / 5,03	.500 / 12,70
4613-04	#4	.563 / 14,29	.0633 / 1,608	.223 / 5,66	.500 / 12,70
4613-05	#5	.563 / 14,29	.0789 / 2,004	.248 / 6,30	.500 / 12,70
4613-06	#6	.563 / 14,29	.0789 / 2,004	.272 / 6,91	.500 / 12,70
4613-08	#8	.563 / 14,29	.0950 / 2,413	.322 / 8,18	.500 / 12,70
4613-10	#10	.563 / 14,29	.1268 / 3,221	.371 / 9,42	.500 / 12,70
4613-25	1/4"	.875 / 22,23	.1585 / 4,026	.447 / 11,35	1.000 / 25,40
4613-31	5/16"	.875 / 22,23	.1898 / 4,821	.557 / 14,15	1.000 / 25,40
4613-37	3/8"	1.250 / 31,75	.2215 / 5,626	.666 / 16,92	1.000 / 25,40
4613-50	1/2"	1.250 / 31,75	.3158 / 8,021	.890 / 22,61	1.000 / 25,40
4613-62	5/8"	1.375 / 34,93	.3788 / 9,622	1.020 / 25,91	1.000 / 25,40

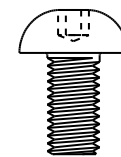
MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
HARDNESS: RC 59-61

# #5613 HEXAGON PINS

ANSI B18.3 1986



HEX BUSHING DESIGN  
BUTTON HEAD CAP SCREW

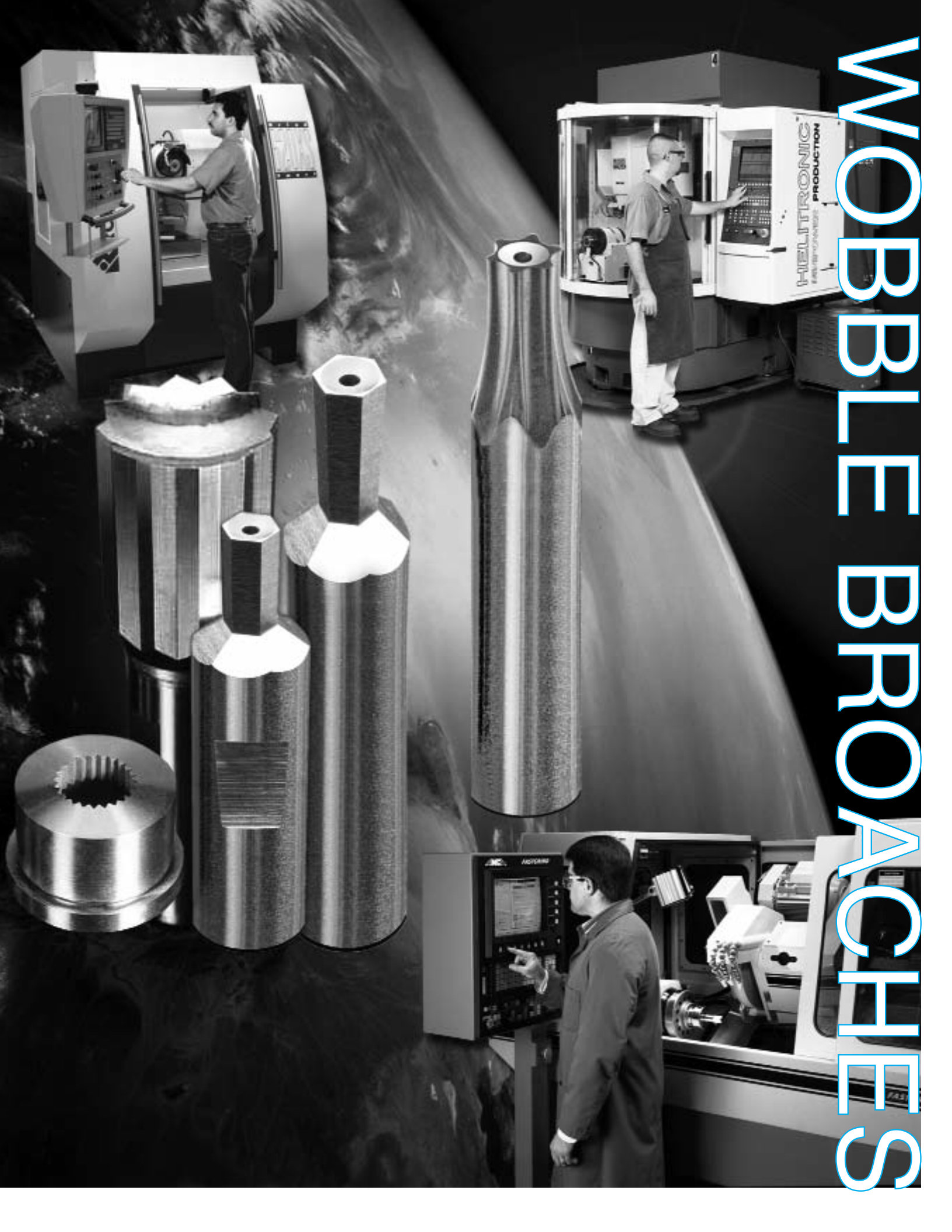


PART NUMBER	SCREW SIZE	B inch / mm	C inch / mm	L inch / mm
5613-01	#1 & #2	.0508 / 1,290	.062 / 1,57	.543 / 13,79
5613-03	#3 & #4	.0633 / 1,608	.078 / 1,98	.544 / 13,82
5613-05	#5 & #6	.0789 / 2,004	.095 / 2,41	.545 / 13,84
5613-08	#8	.0950 / 2,413	.112 / 2,84	.540 / 13,71
5613-10	#10	.1268 / 3,221	.150 / 3,81	.554 / 14,07
5613-25	1/4"	.1585 / 4,026	.187 / 4,75	1.051 / 26,69
5613-31	5/16"	.1898 / 4,821	.221 / 5,61	1.051 / 26,69
5613-37	3/8"	.2215 / 5,626	.260 / 6,60	1.047 / 26,91
5613-50	1/2"	.3158 / 8,021	.370 / 9,40	1.072 / 27,23
5613-62	5/8"	.3788 / 9,622	.445 / 11,56	1.061 / 26,95

MATERIAL: M-2 HIGH SPEED STEEL  
HARDNESS: RC 64-65

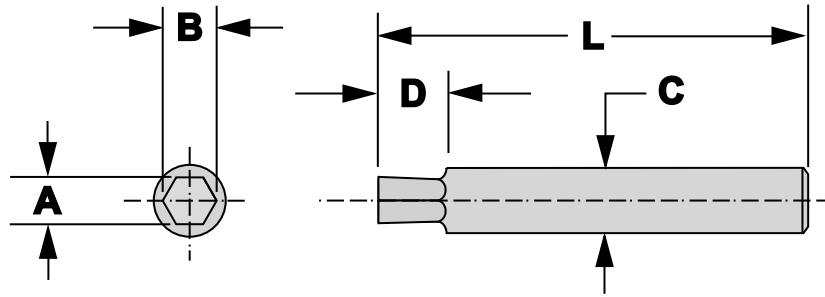
FOR STAINLESS STEEL SCREWS USE "SUPER SERIES"  
PUNCHES. MATERIAL: ASP-30, HARDNESS: RC 65-66

# WOBBLE BROSACHES



# #7000 HEXAGON BROACHES

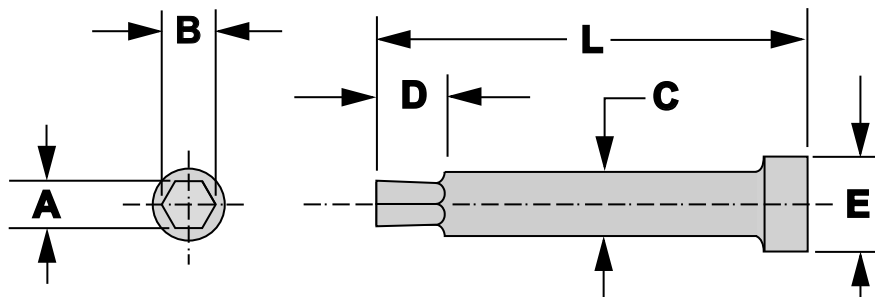
HI-LOK STYLE BRK-12



PART NUMBER	A inch / mm	B inch / mm	C inch / mm	D inch / mm	L inch / mm
7000-5A	.0645 / 1,638	.0745 / 1,892	.187 / 4,76	.250 / 6,35	1.87 / 47,6
7000-5	.0801 / 2,034	.0925 / 2,349	.187 / 4,76	.250 / 6,35	1.87 / 47,6
7000-6	.0806 / 2,047	.0931 / 2,364	.187 / 4,76	.250 / 6,35	1.87 / 47,6
7000-8	.0967 / 2,456	.1117 / 2,971	.187 / 4,76	.250 / 6,35	1.87 / 47,6
7000-10	.1295 / 3,289	.1495 / 3,797	.187 / 4,76	.250 / 6,35	1.87 / 47,6
7000-12	.1617 / 4,107	.1867 / 4,742	.250 / 6,35	.281 / 7,14	1.87 / 47,6
7000-14	.1930 / 4,902	.2229 / 5,661	.250 / 6,35	.281 / 7,14	1.87 / 47,6
7000-16	.2242 / 5,694	.2589 / 6,576	.312 / 7,93	.312 / 7,93	1.87 / 47,6
7000-51	.0648 / 1,645	.0748 / 1,899	.187 / 4,76	.250 / 6,35	1.87 / 47,6
7000-52	.0804 / 2,042	.0928 / 2,357	.187 / 4,76	.250 / 6,35	1.87 / 47,6
7000-61	.0809 / 2,054	.0934 / 2,372	.187 / 4,76	.250 / 6,35	1.87 / 47,6
7000-81	.0970 / 2,463	.1120 / 2,844	.187 / 4,76	.250 / 6,35	1.87 / 47,6
7000-101	.1298 / 3,296	.1499 / 3,807	.187 / 4,76	.250 / 6,35	1.87 / 47,6
7000-121	.1617 / 4,107	.1867 / 4,742	.250 / 6,35	.281 / 7,14	1.87 / 47,6

# #7000B HEXAGON BROACHES

HI-LOK STYLE TA5558

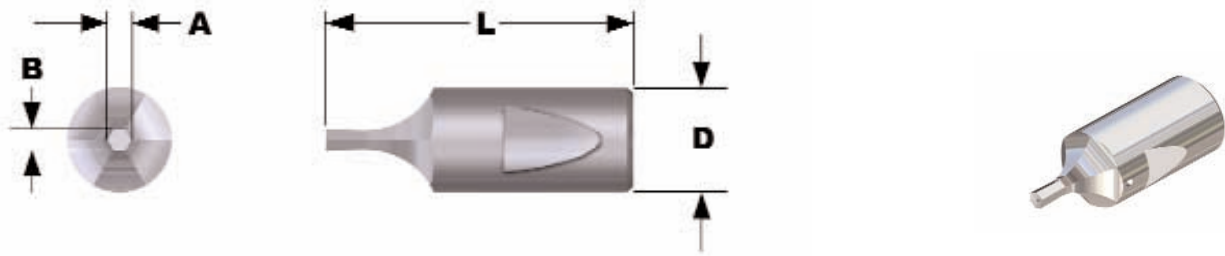


PART NUMBER	A inch / mm	B inch / mm	C inch / mm	D inch / mm	E inch / mm	L inch / mm
7000B-12-1	.0617 / 1,567		.249 / 6,32	.125 / 3,17	.312 / 7,9	1.87 / 47,6
7000B-14-1	.1930 / 4,902		.249 / 6,32	.125 / 3,17	.312 / 7,9	1.87 / 47,6
7000B-16-1	.2242 / 5,694		.300 / 7,62	.125 / 3,17	.363 / 9,2	1.87 / 47,6
7000B-18-1	.2551 / 6,479		.300 / 7,62	.125 / 3,17	.363 / 9,2	1.87 / 47,6
7000B-20-1	.2555 / 6,489		.300 / 7,62	.125 / 3,17	.363 / 9,2	1.87 / 47,6
7000B-24-1	.3190 / 8,102		.437 / 11,09	.125 / 3,17	.500 / 12,7	1.87 / 47,6

MATERIAL: M2 HSS HIGH SPEED STEEL  
 HARDNESS: RC 62-64 TRIPLE DRAWN  
 •MATERIAL: ASP-30 SUPER HIGH SPEED STEEL  
 •HARDNESS: RC 64-66 TRIPLE DRAWN  
 COATINGS: AVAILABLE UPON REQUEST.

# #7100 HEXAGON BROACHES

200 SERIES 5mm x 13mm

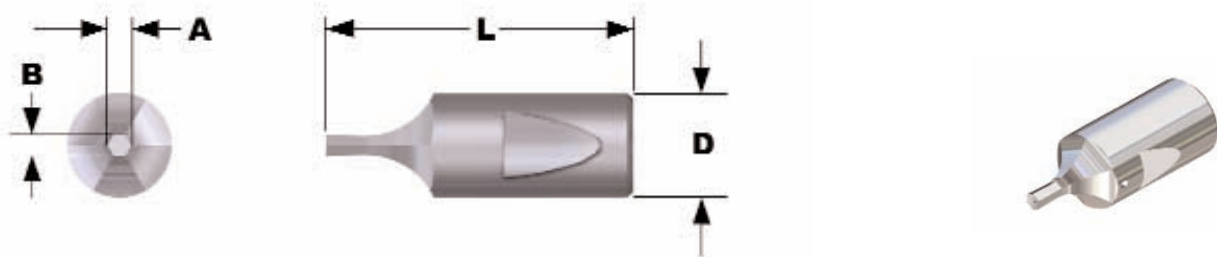


PART NUMBER	NOMINAL SIZE	A inch / mm	B inch / mm	D inch / mm	L inch / mm
7100-5-13-028	.028	.030 / 0,76	.028 / 0,71	.197 / 5,0	.512 / 13,0
7100-5-13-035	.035	.038 / 0,97	.035 / 0,89	.197 / 5,0	.512 / 13,0
7100-5-13-050	.050	.055 / 1,40	.051 / 1,29	.197 / 5,0	.512 / 13,0
7100-5-13-062	1/16	.069 / 1,75	.064 / 1,62	.197 / 5,0	.512 / 13,0
7100-5-13-078	5/64	.086 / 2,18	.079 / 2,01	.197 / 5,0	.512 / 13,0
7100-5-13-094	3/32	.104 / 2,64	.095 / 2,41	.197 / 5,0	.512 / 13,0
7100-5-13-109	7/64	.121 / 3,07	.111 / 2,82	.197 / 5,0	.512 / 13,0
7100-5-13-125	1/8	.150 / 3,81	.127 / 3,22	.197 / 5,0	.512 / 13,0

UNIVERSAL HEXAGON BROACHES ARE AVAILABLE WITH ADDITIONAL FEATURES: • PRESSURE RELIEF VENTING • DISHED CUTTING FACE • PREMIUM (PM) POWDER MATERIALS, STANDARD MATERIAL M42 HIGH SPEED STEELS:HARDNESS RC 64-66 SPECIAL COATINGS: TITANIUM NITANIUM (TIN) OR TITANIUM CARBONITRIDE (TICN).

# #7200 METRIC HEXAGON BROACHES

200 SERIES 5mm x 13mm



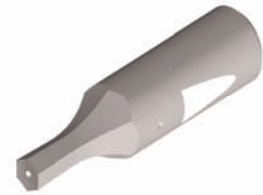
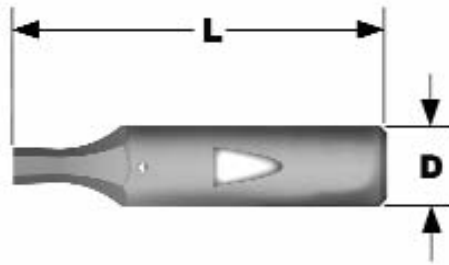
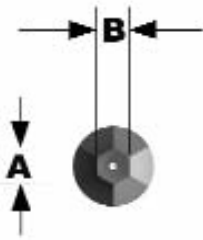
PART NUMBER	NOMINAL SIZE	A inch / mm	B inch / mm	D inch / mm	L inch / mm
7200-5-13-0.7	0,7mm	.030 / 0,76	.028 / 0,71	.197 / 5,0	.512 / 13,0
7200-5-13-0.9	0,9mm	.040 / 1,02	.040 / 1,02	.197 / 5,0	.512 / 13,0
7200-5-13-1.0	1,0mm	.045 / 1,14	.040 / 1,02	.197 / 5,0	.512 / 13,0
7200-5-13-1.3	1,3mm	.059 / 1,50	.051 / 1,30	.197 / 5,0	.512 / 13,0
7200-5-13-1.5	1,5mm	.070 / 1,78	.061 / 1,55	.197 / 5,0	.512 / 13,0
7200-5-13-2.0	2,0mm	.092 / 2,34	.081 / 2,06	.197 / 5,0	.512 / 13,0
7200-5-13-2.5	2,5mm	.117 / 2,97	.101 / 2,56	.197 / 5,0	.512 / 13,0
7200-5-13-3.0	3,0mm	.140 / 3,55	.121 / 3,07	.197 / 5,0	.512 / 13,0

UNIVERSAL HEXAGON BROACHES ARE AVAILABLE WITH ADDITIONAL FEATURES: • PRESSURE RELIEF VENTING • DISHED CUTTING FACE • PREMIUM (PM) POWDER MATERIALS, STANDARD MATERIAL M42 HIGH SPEED STEELS:HARDNESS RC 64-66 SPECIAL COATINGS: TITANIUM NITANIUM (TIN) OR TITANIUM CARBONITRIDE (TICN).



# #7100 HEXAGON BROACHES

315 SERIES 8mm x 28 / 32mm



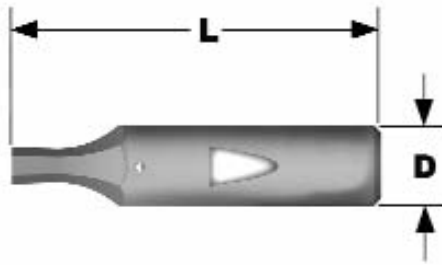
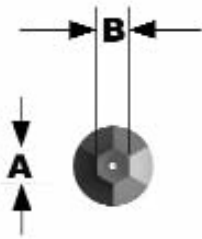
PART NUMBER	NOMINAL SIZE	A		B		D		L	
		inch	mm	inch	mm	inch	mm	inch	mm
7100-8-28-051	.050	.059	1,50	.051	1,29	.315	8,0	1.10	28,00
7100-8-32-051	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-064	1/16	.074	1,88	.064	1,62	.315	8,0	1.10	28,00
7100-8-32-064	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-079	5/64	.091	2,31	.079	2,01	.315	8,0	1.10	28,00
7100-8-32-079	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-095	3/32	.110	2,79	.095	2,41	.315	8,0	1.10	28,00
7100-8-32-095	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-111	7/64	.128	3,25	.111	2,82	.315	8,0	1.10	28,00
7100-8-32-111	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-127	1/8	.147	3,73	.127	3,22	.315	8,0	1.10	28,00
7100-8-32-127	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-143	9/64	.165	4,19	.143	3,63	.315	8,0	1.10	28,00
7100-8-32-143	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-159	5/32	.184	4,67	.159	4,04	.315	8,0	1.10	28,00
7100-8-32-159	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-174	11/64	.201	5,10	.174	4,42	.315	8,0	1.10	28,00
7100-8-32-174	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-190	3/16	.219	5,56	.190	4,83	.315	8,0	1.10	28,00
7100-8-32-190	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-222	7/32	.256	6,50	.222	5,64	.315	8,0	1.10	28,00
7100-8-32-222	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-253	1/4	.292	7,42	.253	6,43	.315	8,0	1.10	28,00
7100-8-32-253	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-284	9/32	.328	8,33	.284	7,21	.315	8,0	1.10	28,00
7100-8-32-284	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-316	5/16	.365	9,27	.316	8,03	.315	8,0	1.10	28,00
7100-8-32-316	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-347	11/32	.401	10,18	.347	8,81	.315	8,0	1.10	28,00
7100-8-32-347	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-379	3/8	.438	11,12	.379	9,63	.315	8,0	1.10	28,00
7100-8-32-379	-	-	-	-	-	-	-	1.25	31,75
7100-8-28-410	13/32	.473	12,01	.410	10,41	.315	8,0	1.10	28,00
7100-8-32-410	-	-	-	-	-	-	-	1.25	31,75

UNIVERSAL HEXAGON BROACHES ARE AVAILABLE WITH ADDITIONAL FEATURES: • PRESSURE RELIEF VENTING • DISHED CUTTING FACE • PREMIUM (PM) POWDER MATERIALS, STANDARD MATERIAL M42 HIGH SPEED STEELS:HARDNESS RC 64-66 SPECIAL COATINGS: TITANIUM NITANIUM (TIN) OR TITANIUM CARBONITRIDE (TICN).



# #7200 METRIC HEXAGON BROACHES

315 SERIES 8mm x 28 / 32mm

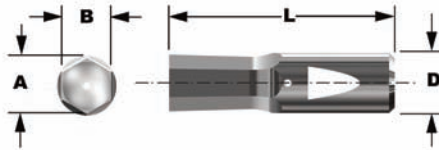


PART NUMBER	NOMINAL SIZE	A	B	D	L
		inch / mm	inch / mm	inch / mm	inch / mm
7200-8-28-1.30	1,3mm	.056 / 1,42	.051/1.29	.315 / 8,0	1.10 / 28,00
7200-8-32-1.30	-	-	-	-	1.25 / 31,75
7200-8-28-1.50	1,5mm	.070 / 1,78	.061/1.55	.315 / 8,0	1.10 / 28,00
7200-8-32-1.50	-	-	-	-	1.25 / 31,75
7200-8-28-2.00	2,0mm	.090 / 2,29	.081/2.05	.315 / 8,0	1.10 / 28,00
7200-8-32-2.00	-	-	-	-	1.25 / 31,75
7200-8-28-2.50	2,5mm	.120 / 3,05	.101/2.56	.315 / 8,0	1.10 / 28,00
7200-8-32-2.50	-	-	-	-	1.25 / 31,75
7200-8-28-3.00	3,0mm	.140 / 3,56	.121/3.07	.315 / 8,0	1.10 / 28,00
7200-8-32-3.00	-	-	-	-	1.25 / 31,75
7200-8-28-4.00	4,0mm	.190 / 4,83	.161/4.08	.315 / 8,0	1.10 / 28,00
7200-8-32-4.00	-	-	-	-	1.25 / 31,75
7200-8-28-5.00	5,0mm	.230 / 5,84	.200/5.08	.315 / 8,0	1.10 / 28,00
7200-8-32-5.00	-	-	-	-	1.25 / 31,75
7200-8-28-6.00	6,0mm	.280 / 7,11	.240/6.10	.315 / 8,0	1.10 / 28,00
7200-8-32-6.00	-	-	-	-	1.25 / 31,75
7200-8-28-7.00	7,0mm	.320 / 8,13	.279/7.08	.315 / 8,0	1.10 / 28,00
7200-8-32-7.00	-	-	-	-	1.25 / 31,75
7200-8-28-8.00	8,0mm	.370 / 9,40	.320/8.13	.315 / 8,0	1.10 / 28,00
7200-8-32-8.00	-	-	-	-	1.25 / 31,75
7200-8-28-9.00	9,0mm	.413 / 10,49	.358/9.09	.315 / 8,0	1.10 / 28,00
7200-8-32-9.00	-	-	-	-	1.25 / 31,75
7200-8-28-10.0	10,0mm	.461 / 11,71	.399/10.13	.315 / 8,0	1.10 / 28,00
7200-8-32-10.0	-	-	-	-	1.25 / 31,75
7200-8-28-11.0	11,0mm	.505 / 12,82	.437/11.10	.315 / 8,0	1.10 / 28,00
7200-8-32-11.0	-	-	-	-	1.25 / 31,75
7200-8-28-12.0	12,0mm	.552 / 14,02	.478/12.14	.315 / 8,0	1.10 / 28,00
7200-8-32-12.0	-	-	-	-	1.25 / 31,75
7200-8-28-13.0	13,0mm	.597 / 15,16	.517/13.13	.315 / 8,0	1.10 / 28,00
7200-8-32-13.0	-	-	-	-	1.25 / 31,75
7200-8-28-14.0	14,0mm	.643 / 16,33	.557/14.15	.315 / 8,0	1.10 / 28,00
7200-8-32-14.0	-	-	-	-	1.25 / 31,75
7200-8-28-15.0	15,0mm	.689 / 17,50	.597/15.16	.315 / 8,0	1.10 / 28,00
7200-8-32-15.0	-	-	-	-	1.25 / 31,75
7200-8-28-16.0	16,0mm	.734 / 18,64	.636/16.15	.315 / 8,0	1.10 / 28,00
7200-8-32-16.0	-	-	-	-	1.25 / 31,75

UNIVERSAL HEXAGON BROACHES ARE AVAILABLE WITH ADDITIONAL FEATURES: • PRESSURE RELIEF VENTING • DISHED CUTTING FACE • PREMIUM (PM) POWDER MATERIALS, STANDARD MATERIAL M42 HIGH SPEED STEELS:HARDNESS RC 64-66 SPECIAL COATINGS: TITANIUM NITANIUM (TIN) OR TITANIUM CARBONITRIDE (TICN).

# #7100 HEXAGON BROACHES

500 SERIES 12.7mm x 44mm

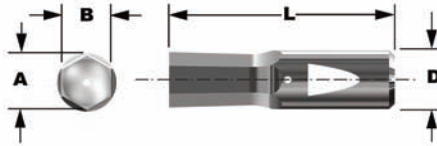


PART NUMBER	NOMINAL SIZE	A inch / mm	B inch / mm	D inch / mm	L inch / mm
7100-12-44-093	3/32	.110 / 2,79	.095 / 2,41	.500 / 12,70	1.75 / 44,20
7100-12-44-109	7/64	.128 / 3,26	.111 / 2,82	.500 / 12,70	1.75 / 44,20
7100-12-44-125	1/8	.147 / 3,72	.127 / 3,23	.500 / 12,70	1.75 / 44,20
7100-12-44-140	9/64	.165 / 4,19	.143 / 3,63	.500 / 12,70	1.75 / 44,20
7100-12-44-156	5/32	.184 / 4,66	.159 / 4,04	.500 / 12,70	1.75 / 44,20
7100-12-44-171	11/64	.201 / 5,10	.174 / 4,42	.500 / 12,70	1.75 / 44,20
7100-12-44-187	3/16	.219 / 5,57	.190 / 4,83	.500 / 12,70	1.75 / 44,20
7100-12-44-218	7/32	.256 / 6,51	.222 / 5,64	.500 / 12,70	1.75 / 44,20
7100-12-44-250	1/4	.292 / 7,42	.253 / 6,43	.500 / 12,70	1.75 / 44,20
7100-12-44-281	9/32	.328 / 8,33	.284 / 7,21	.500 / 12,70	1.75 / 44,20
7100-12-44-312	5/16	.365 / 9,27	.316 / 8,03	.500 / 12,70	1.75 / 44,20
7100-12-44-343	11/32	.401 / 10,49	.347 / 8,81	.500 / 12,70	1.75 / 44,20
7100-12-44-375	3/8	.438 / 11,71	.379 / 9,63	.500 / 12,70	1.75 / 44,20
7100-12-44-406	13/32	.473 / 12,03	.410 / 10,41	.500 / 12,70	1.75 / 44,20
7100-12-44-437	7/16	.510 / 12,96	.442 / 11,23	.500 / 12,70	1.75 / 44,20
7100-12-44-468	15/32	.546 / 13,87	.473 / 12,01	.500 / 12,70	1.75 / 44,20
7100-12-44-500	1/2	.583 / 14,81	.505 / 12,83	.500 / 12,70	1.75 / 44,20
7100-12-44-531	17/32	.619 / 15,72	.536 / 13,61	.500 / 12,70	1.75 / 44,20
7100-12-44-562	9/16	.656 / 16,66	.568 / 14,43	.500 / 12,70	1.75 / 44,20
7100-12-44-593	19/32	.692 / 17,57	.599 / 15,21	.500 / 12,70	1.75 / 44,20
7100-12-44-625	5/8	.729 / 18,51	.631 / 16,03	.500 / 12,70	1.75 / 44,20
7100-12-44-656	21/32	.764 / 19,42	.662 / 16,81	.500 / 12,70	1.75 / 44,20
7100-12-44-687	11/16	.801 / 20,35	.694 / 17,63	.500 / 12,70	1.75 / 44,20
7100-12-44-718	23/32	.837 / 21,26	.725 / 18,42	.500 / 12,70	1.75 / 44,20
7100-12-44-750	3/4	.874 / 22,20	.757 / 19,23	.500 / 12,70	1.75 / 44,20
7100-12-44-750	25/32	.911 / 23,14	.789 / 20,04	.500 / 12,70	1.75 / 44,20
7100-12-44-750	13/16	.948 / 24,08	.821 / 20,85	.500 / 12,70	1.75 / 44,20

UNIVERSAL HEXAGON BROACHES ARE AVAILABLE WITH ADDITIONAL FEATURES: • PRESSURE RELIEF VENTING • DISHED CUTTING FACE • PREMIUM (PM) POWDER MATERIALS, STANDARD MATERIAL M42 HIGH SPEED STEELS:HARDNESS RC 64-66 SPECIAL COATINGS: TITANIUM NITANIUM (TIN) OR TITANIUM CARBONITRIDE (TICN).

# #7200 METRIC HEXAGON BROACHES

500 SERIES 12.7mm x 44mm

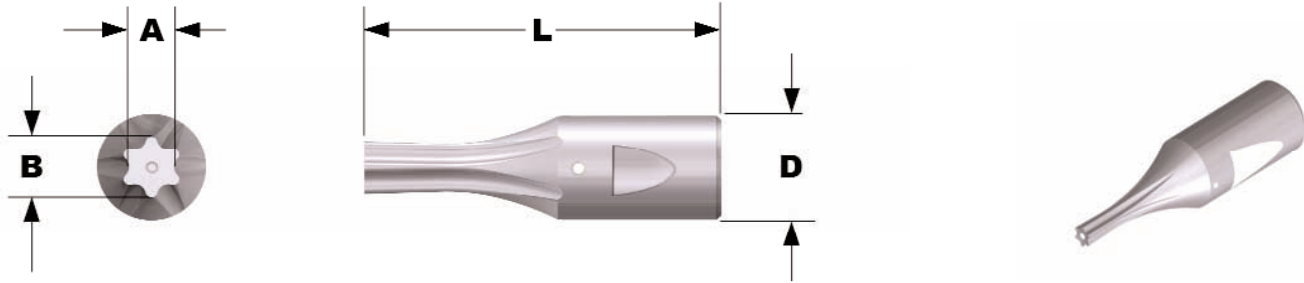


PART NUMBER	NOMINAL SIZE	A inch / mm	B inch / mm	D inch / mm	L inch / mm
7200-12-44-2.00	2,0mm	.094 / 2,38	.081 / 2,06	.500 / 12,70	1.75 / 44,20
7200-12-44-2.50	2,5mm	.117 / 2,96	.101 / 2,57	.500 / 12,70	1.75 / 44,20
7200-12-44-3.00	3,0mm	.140 / 3,55	.121 / 3,07	.500 / 12,70	1.75 / 44,20
7200-12-44-4.00	4,0mm	.186 / 4,72	.161 / 4,09	.500 / 12,70	1.75 / 44,20
7200-12-44-5.00	5,0mm	.231 / 5,87	.200 / 5,08	.500 / 12,70	1.75 / 44,20
7200-12-44-6.00	6,0mm	.277 / 7,04	.240 / 6,10	.500 / 12,70	1.75 / 44,20
7200-12-44-7.00	7,0mm	.322 / 8,18	.279 / 7,09	.500 / 12,70	1.75 / 44,20
7200-12-44-8.00	8,0mm	.370 / 9,39	.320 / 8,13	.500 / 12,70	1.75 / 44,20
7200-12-44-9.00	9,0mm	.413 / 10,50	.358 / 9,09	.500 / 12,70	1.75 / 44,20
7200-12-44-10.0	10,0mm	.461 / 11,70	.399 / 10,13	.500 / 12,70	1.75 / 44,20
7200-12-44-11.0	11,0mm	.505 / 12,82	.437 / 11,10	.500 / 12,70	1.75 / 44,20
7200-12-44-12.0	12,0mm	.552 / 14,02	.478 / 12,14	.500 / 12,70	1.75 / 44,20
7200-12-44-13.0	13,0mm	.597 / 15,16	.517 / 13,13	.500 / 12,70	1.75 / 44,20
7200-12-44-14.0	14,0mm	.643 / 16,34	.557 / 14,15	.500 / 12,70	1.75 / 44,20
7200-12-44-15.0	15,0mm	.689 / 17,51	.597 / 15,16	.500 / 12,70	1.75 / 44,20
7200-12-44-16.0	16,0mm	.734 / 18,65	.636 / 16,15	.500 / 12,70	1.75 / 44,20
7200-12-44-17.0	17,0mm	.783 / 19,89	.678 / 17,22	.500 / 12,70	1.75 / 44,20
7200-12-44-18.0	18,0mm	.826 / 20,97	.715 / 18,16	.500 / 12,70	1.75 / 44,20
7200-12-44-19.0	19,0mm	.875 / 22,23	.758 / 19,25	.500 / 12,70	1.75 / 44,20
7200-12-44-20.0	20,0mm	.918 / 23,32	.795 / 20,19	.500 / 12,70	1.75 / 44,20
7200-12-44-21.0	21,0mm	.965 / 24,52	.836 / 21,23	.500 / 12,70	1.75 / 44,20
7200-12-44-22.0	22,0mm	1.02 / 25,78	.879 / 22,33	.500 / 12,70	1.75 / 44,20
7200-12-44-23.0	23,0mm	1.06 / 26,87	.916 / 23,27	.500 / 12,70	1.75 / 44,20

UNIVERSAL HEXAGON BROACHES ARE AVAILABLE WITH ADDITIONAL FEATURES: • PRESSURE RELIEF VENTING • DISHED CUTTING FACE • PREMIUM (PM) POWDER MATERIALS, STANDARD MATERIAL M42 HIGH SPEED STEELS: HARDNESS RC 64-66 SPECIAL COATINGS: TITANIUM NITRIDE (TiN) OR TITANIUM CARBONITRIDE (TiCN).

# #7300 6-LOBE (TX) HEXALOBULAR BROACHES

200 Series 5mm

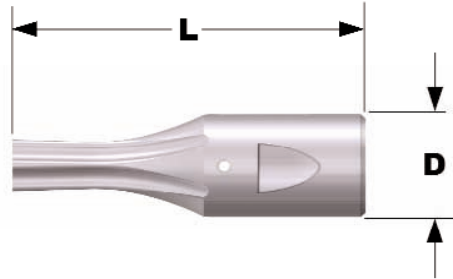
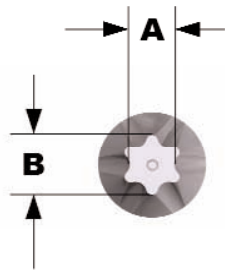


PART NUMBER	DRIVE SIZE	A inch / mm	B inch / mm	D inch / mm	L inch / mm
7300-5-13-01	1	.035/0.90	.025/.065	.197/5.00	.512/13.0
7300-5-13-02	2	.039/1.01	.028/0.73	.197/5.00	.512/13.0
7300-5-13-03	3	.047/1.21	.034/0.88	.197/5.00	.512/13.0
7300-5-13-04	4	.054/1.37	.039/0.99	.197/5.00	.512/13.0
7300-5-13-05	5	.059/1.49	.043/1.09	.197/5.00	.512/13.0
7300-5-13-06	6	.070/1.77	.050/1.29	.197/5.00	.512/13.0
7300-5-13-07	7	.082/2.09	.059/1.52	.197/5.00	.512/13.0
7300-5-13-08	8	.095/2.41	.069/1.75	.197/5.00	.512/13.0

UNIVERSAL HEXAGON BROACHES ARE AVAILABLE WITH ADDITIONAL FEATURES: • PRESSURE RELIEF VENTING • DISHED CUTTING FACE • PREMIUM (PM) POWDER MATERIALS, STANDARD MATERIAL M42 HIGH SPEED STEELS:HARDNESS RC 64-66 SPECIAL COATINGS: TITANIUM NITANIUM (TIN) OR TITANIUM CARBONITRIDE (TICN).

# #7300 6-LOBE (TX) HEXALOBULAR BROACHES

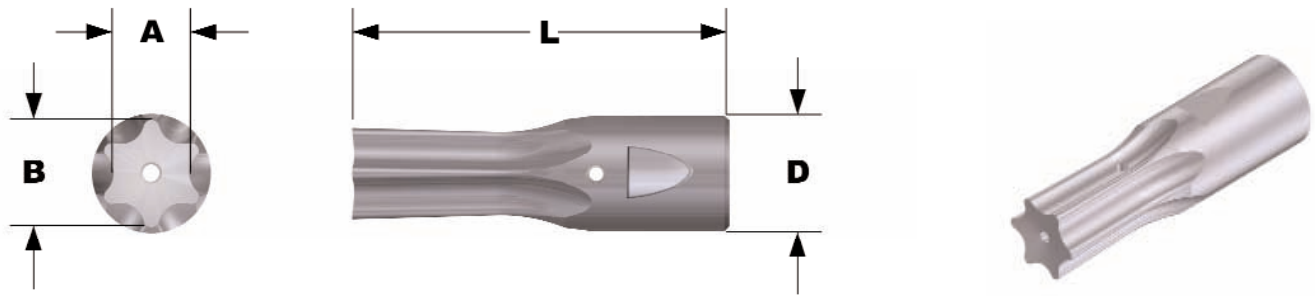
315 Series 8mm



PART NUMBER	DRIVE SIZE	A		B		D		L	
		inch	mm	inch	mm	inch	mm	inch	mm
7300-8-28-05	5	.043	1.09	.059	1.50	.315	8.00	1.10	28.00
7300-8-32-05	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-06	6	.050	1.27	.069	1.75	.315	8.00	1.10	28.00
7300-8-32-06	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-07	7	.059	1.50	.082	2.08	.315	8.00	1.10	28.00
7300-8-32-07	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-08	8	.068	1.73	.094	2.39	.315	8.00	1.10	28.00
7300-8-32-08	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-09	9	.073	1.85	.102	2.59	.315	8.00	1.10	28.00
7300-8-32-09	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-10	10	.080	2.03	.111	2.82	.315	8.00	1.10	28.00
7300-8-32-10	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-15	15	.096	2.44	.132	3.35	.315	8.00	1.10	28.00
7300-8-32-15	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-20	20	.113	2.87	.155	3.94	.315	8.00	1.10	28.00
7300-8-32-20	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-25	25	.129	3.28	.178	4.52	.315	8.00	1.10	28.00
7300-8-32-25	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-27	27	.145	3.68	.201	5.11	.315	8.00	1.10	28.00
7300-8-32-27	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-30	30	.160	4.06	.222	5.64	.315	8.00	1.10	28.00
7300-8-32-30	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-40	40	.192	4.88	.267	6.78	.315	8.00	1.10	28.00
7300-8-32-40	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-45	45	.223	5.66	.313	7.95	.315	8.00	1.10	28.00
7300-8-32-45	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-50	50	.254	6.45	.353	8.97	.315	8.00	1.10	28.00
7300-8-32-50	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-55	55	.317	8.05	.447	11.35	.315	8.00	1.10	28.00
7300-8-32-55	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-60	60	.379	9.63	.529	13.44	.315	8.00	1.10	28.00
7300-8-32-60	-	-	-	-	-	-	-	1.25	31.75
7300-8-28-70	70	.442	11.23	.619	15.72	.315	8.00	1.10	28.00
7300-8-32-70	-	-	-	-	-	-	-	1.25	31.75

UNIVERSAL HEXAGON BROACHES ARE AVAILABLE WITH ADDITIONAL FEATURES: • PRESSURE RELIEF VENTING • DISHED CUTTING FACE • PREMIUM (PM) POWDER MATERIALS, STANDARD MATERIAL M42 HIGH SPEED STEELS:HARDNESS RC 64-66 SPECIAL COATINGS: TITANIUM NITANIUM (TIN) OR TITANIUM CARBONITRIDE (TICN).

# #7300 6-LOBE (TX) HEXALOBULAR BROACHES 500 Series 12.7mm

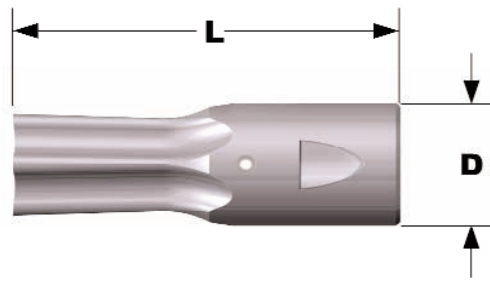
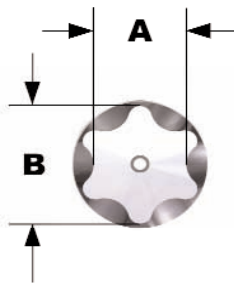


PART NUMBER	DRIVE SIZE	A		B		D		L	
		inch	mm	inch	mm	inch	mm	inch	mm
7300-12-44-05	5	.059	1.49	.043	1.09	.500	12.70	1.75	44.20
7300-12-44-06	6	.070	1.77	.050	1.29	.500	12.70	1.75	44.20
7300-12-44-07	7	.082	2.09	.059	1.52	.500	12.70	1.75	44.20
7300-12-44-08	8	.095	2.41	.069	1.75	.500	12.70	1.75	44.20
7300-12-44-09	9	.102	2.60	.074	1.88	.500	12.70	1.75	44.20
7300-12-44-10	10	.111	2.81	.081	2.05	.500	12.70	1.75	44.20
7300-12-44-15	15	.132	3.35	.096	2.43	.500	12.70	1.75	44.20
7300-12-44-20	20	.155	3.93	.112	2.85	.500	12.70	1.75	44.20
7300-12-44-25	25	.178	4.53	.129	3.27	.500	12.70	1.75	44.20
7300-12-44-27	27	.200	5.09	.144	3.67	.500	12.70	1.75	44.20
7300-12-44-30	30	.221	5.62	.160	4.06	.500	12.70	1.75	44.20
7300-12-44-40	40	.267	6.78	.192	4.89	.500	12.70	1.75	44.20
7300-12-44-45	45	.313	7.95	.224	5.68	.500	12.70	1.75	44.20
7300-12-44-50	50	.353	8.96	.256	6.50	.500	12.70	1.75	44.20
7300-12-44-55	55	.447	11.35	.318	8.09	.500	12.70	1.75	44.20
7300-12-44-60	60	.529	13.44	.381	9.67	.500	12.70	1.75	44.20
7300-12-44-70	70	.619	15.72	.443	11.26	.500	12.70	1.75	44.20
7300-12-44-80	80	.700	17.79	.508	12.90	.500	12.70	1.75	44.20
7300-12-44-90	90	.796	20.21	.569	14.46	.500	12.70	1.75	44.20
7300-12-44-100	100	.883	22.42	.632	16.05	.500	12.70	1.75	44.20

UNIVERSAL HEXAGON BROACHES ARE AVAILABLE WITH ADDITIONAL FEATURES: • PRESSURE RELIEF VENTING • DISHED CUTTING FACE • PREMIUM (PM) POWDER MATERIALS, STANDARD MATERIAL M42 HIGH SPEED STEELS: HARDNESS RC 64-66 SPECIAL COATINGS: TITANIUM NITRIDE (TiN) OR TITANIUM CARBONITRIDE (TiCN).

# #7300 6-LOBE (TX) HEXALOBULAR BROACHES

750 Series 19mm

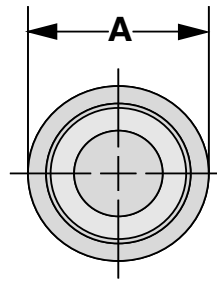
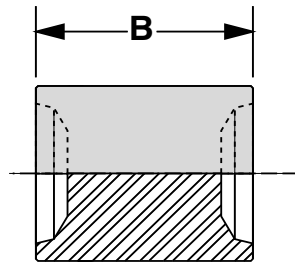


PART NUMBER	DRIVE SIZE	A inch / mm	B inch / mm	D inch / mm	L inch / mm
7300-19-70-20	20	.113/2.87	.155/3.94	.750/19.05	2.75/69.85
7300-19-70-25	25	.129/3.28	.178/4.52	.750/19.05	2.75/69.85
7300-19-70-27	27	.145/3.68	.201/5.11	.750/19.05	2.75/69.85
7300-19-70-30	30	.160/4.06	.222/5.64	.750/19.05	2.75/69.85
7300-19-70-40	40	.192/4.88	.267/6.78	.750/19.05	2.75/69.85
7300-19-70-45	45	.223/5.66	.313/7.95	.750/19.05	2.75/69.85
7300-19-70-50	50	.254/6.45	.353/8.97	.750/19.05	2.75/69.85
7300-19-70-55	55	.317/8.05	.447/11.35	.750/19.05	2.75/69.85
7300-19-70-60	60	.379/9.63	.529/13.44	.750/19.05	2.75/69.85
7300-19-70-70	70	.442/11.23	.619/15.72	.750/19.05	2.75/69.85
7300-19-70-80	80	.505/12.83	.700/17.78	.750/19.05	2.75/69.85
7300-19-70-90	90	.568/14.43	.796/20.22	.750/19.05	2.75/69.85
7300-19-70-100	100	.630/16.00	.883/22.43	.750/19.05	2.75/69.85

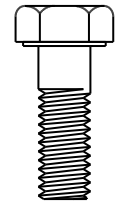
UNIVERSAL HEXAGON BROACHES ARE AVAILABLE WITH ADDITIONAL FEATURES: • PRESSURE RELIEF VENTING • DISHED CUTTING FACE • PREMIUM (PM) POWDER MATERIALS, STANDARD MATERIAL M42 HIGH SPEED STEELS:HARDNESS RC 64-66 SPECIAL COATINGS: TITANIUM NITANIUM (TIN) OR TITANIUM CARBONITRIDE (TICN).



## #8800 HAMMER INSERT BLANKS



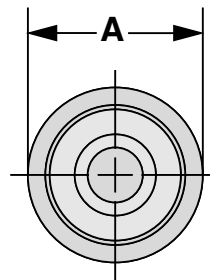
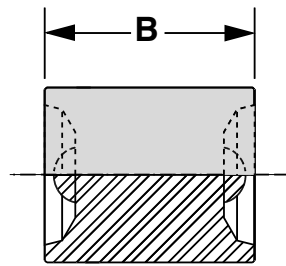
FLAT STYLE  
DOUBLE ENDED



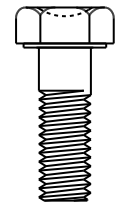
PART NUMBER	SCREW SIZE	HEX SIZE	A inch / mm	B inch / mm
8800-08	8	5/16"	.625 / 15,87	1.000 / 25,40
8800-10	10	3/8"	.625 / 15,87	1.000 / 25,40
8800-25	1/4"	7/16"	.750 / 19,05	1.000 / 25,40
8800-31	5/16"	1/2"	.875 / 22,22	1.000 / 25,40
8800-37	3/8"	9/16"	1.000 / 25,40	1.000 / 25,40
8800-43	7/16"	11/16"	1.125 / 28,57	1.000 / 25,40
8800-50	1/2"	3/4"	1.250 / 31,75	1.000 / 25,40
8800-56	9/16"	7/8"	1.500 / 38,10	1.250 / 31,75
8800-62	5/8"	15/16"	1.500 / 38,10	1.250 / 31,75

MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
NOT HEAT TREATED, READY FOR LETTER IDENTIFICATION.

## #8825 HAMMER INSERT BLANKS



DIMPLE STYLE  
DOUBLE ENDED



PART NUMBER	SCREW SIZE	HEX SIZE	A inch / mm	B inch / mm
8825-10	10	3/8"	.625 / 15,87	1.000 / 25,40
8825-25	1/4"	7/16"	.750 / 19,05	1.000 / 25,40
8825-31	5/16"	1/2"	.875 / 22,22	1.000 / 25,40
8825-37	3/8"	9/16"	1.000 / 25,40	1.000 / 25,40
8825-43	7/16"	11/16"	1.125 / 28,57	1.000 / 25,40
8825-50	1/2"	3/4"	1.250 / 31,75	1.000 / 25,40
8825-56	9/16"	7/8"	1.500 / 38,10	1.250 / 31,75
8825-62	5/8"	15/16"	1.500 / 38,10	1.250 / 31,75

MATERIAL: D-2 HIGH CARBON/HIGH CHROME STEEL  
NOT HEAT TREATED, READY FOR LETTER IDENTIFICATION.

# #8900 GAGE STORAGE BOXES

## PROTECTION STORAGE BOXES STORAGE AND SHIPPING PURPOSES

PART NUMBER	PART DESCRIPTION
8900-01	GAGE BOX GRAY (SINGLE L SIZE)
8900-02	GAGE BOX GRAY (SINGLE XL SIZE)
8900-03	GAGE BOX BLACK (3 PIECE SET)
8900-04	GAGE BOX BLACK (FOUR PIECES)
8900-05	GAGE BOX RED (FOUR PIECES)

Universal's Plastic Gage Boxes are design to fit all penetration style gages and Go/NoGo Gages. There are two internal foam velvet lining sizes that will offer the storage and protection that will assure years of use. These cases offer the best and economical way to protect your company's investment from any damage when not being used.



## #8915 SCREW SLOT PENETRATION GAGE

FOR SLOTTED HEAD SCREWS  
ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
8915-01	SCREW SLOT PENETRATION GAUGE PROBE WIDTH .022" / 0,6mm PROBE DEPTH UP TO 7/16" / 11mm



Universal's Screw Slot Penetration Gage Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify: Inch or Metric Dial Indicator; SPC-Compatible With Digital Indicators.

## #8916 TOTAL RECESS DEPTH GAGE

FOR ALL CROSS RECESS HEAD SCREWS  
ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
8916-00	0
8916-01	1
8916-02	2
8916-03	3
8916-04	4



Universal's Total Recess Depth Penetration Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify: Inch or Metric Dial Indicator; SPC-Compatible With Digital Indicators.

## #9000 TYPE I PENETRATION GAGES

FOR TYPE I CROSS RECESS HEAD SCREWS  
ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
9000-00	0
9000-01	1
9000-02	2
9000-03	3
9000-04	4

Universal's Type-1 Penetration Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify: Inch or Metric Dial Indicator; SPC- Compatible With Digital Indicators.



## #9006 TYPE 1A PENETRATION GAGES

FOR TYPE 1A CROSS RECESS HEAD SCREWS  
ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
9006-00	0
9006-01	1
9006-02	2
9006-03	3
9006-04	4

Universal's Type 1A Penetration Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify: Inch or Metric Dial Indicator; SPC- Compatible With Digital Indicators.



## #9025 HEXAGON PENETRATION GAGES

FOR SOCKET CAP, SHOULDER AND SET SCREWS  
ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	HEX SIZE
9025-03	.035"
9025-05	.050"
9025-06	1/16"
9025-07	5/64"
9025-09	3/32"
9025-10	7/64"
9025-12	1/8"
9025-14	9/64"
9025-15	5/32"
9025-18	3/16"
9025-21	7/32"
9025-25	1/4"
9025-31	5/16"
9025-37	3/8"
9025-43	7/16"
9025-50	1/2"
9025-56	9/16"
9025-62	5/8"
9025-75	3/4"
9025-87	7/8"



When Ordering Specify: Inch Or Metric Dial Indicator  
SPC-Compatible With Digital Indicators  
Note: Tamper-Proof Style Available Specify When Ordering.

## #9040 METRIC HEXAGON PENETRATION GAGES

FOR SOCKET CAP, SHOULDER AND SET SCREWS  
ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	HEX SIZE	ISO4762 (DIN912) JIS1176	ISO4762 (DIN7991) JIS1194	ISO 4026/4028 (DIN 913/916) JIS1177
9040-0.7	0.7mm	-	-	M1.4/M1.6/M1.8
9040-0.9	0.9mm	-	-	M2
9040-1.3	1.3mm	M1.4	-	M2.5
9040-1.5	1.5mm	M1.6/M2	-	M3
9040-2.0	2mm	M2.5	M3	M4
9040-2.5	2.5mm	M3	M4	M5
9040-3.0	3mm	M4	M5	M6
9040-4.0	4mm	M6	M6	M8
9040-5.0	5mm	M6	M8	M10
9040-6.0	6mm	M8	M10	M12/14
9040-8.0	8mm	M10	M12	M16
9040-10	10mm	M12	M14/M16	M18/M20
9040-12	12mm	M14	M18/M20	M22/M24
9040-14	14mm	M16/M18	M22/M24	-
9040-16	16mm	-	-	-
9040-17	17mm	M20/M22	-	-
9040-19	19mm	M24/M27	-	-
9040-22	22mm	M30	-	-
9040-24	24mm	M33	-	-



When Ordering Specify: Inch Or Metric Dial Indicator  
SPC-Compatible With Digital Indicators  
Note: Tamper-Proof Style Available Specify When Ordering.

## #9043 WRENCHING HEIGHT GAGES

FOR HEXAGON WASHER HEAD SCREWS  
ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	SCREW SIZE	HEX SIZE
9043-12	#2 / #3	1/8"
9043-18	#4 / #5	3/16"
9043-25	#6 / #7 / #8	1/4"
9043-31	#10 / #12	5/16"
9043-37	1/4"	3/8"
9043-50	5/16"	1/2"
9043-56	3/8"	9/16"
9043-62	7/16"	5/8"
9043-75	1/2"	3/4"

Universal's Wrenching Height Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify: Inch or Metric Dial Indicator; SPC-Compatible With Digital Indicators.



## #9044 WRENCHING HEIGHT GAGES

FOR HEXAGON WASHER HEAD SCREWS  
ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	SCREW SIZE	HEX SIZE
9044-3.2	M2X0,4	3.2mm
9044-04	M2,5X0,45	4.0mm
9044-05	M3X0,5	5.0mm
9044-5.5	M3,5X0,6	5.5mm
9044-07	M4X0,7	7.0mm
9044-08	M5X0,8	8.0mm
9044-10	M6X1	10mm
9044-13	M8X1,25	13mm
9044-15	M10X1,5	15mm
9044-18	M12X1,75	18mm

Universal's Wrenching Height Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify: Inch or Metric Dial Indicator; SPC-Compatible With Digital Indicators.



## #9045 OFFSET CRUCIFORM PENETRATION GAGES

### FOR OFFSET CRUCIFORM RECESS HEAD SCREWS NASM33781B AND NASM14191 STANDARDS

PART NUMBER	ACR NASM 14191	RECESS SIZE
9045-0	-	0
9045-1	-	1
9045-2	-	2
9045-3	-	3
9045-4	-	4
9045-5	-	5
9045-6	9045-6*	6
9045-8	9045-8*	8
9045-10	9045-10*	10
9045-25	9045-25*	1/4
9045-31	9045-31*	5/16
9045-38	-	3/8
9045-41	-	7/16
9045-50	-	1/2
9045-56	-	9/16
9045-63	-	5/8
9045-75	-	3/4



Universal's Offset Cruciform Penetration Gage Probes Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gauges Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify: Inch or Metric Dial Indicator; SPC-Compatible With Digital Indicators.

## #9050 SQUARE DRIVE PENETRATION GAGES

### FOR SQUARE RECESS HEAD SCREWS ROBERTSON SQUARE DRIVE STANDARDS

PART NUMBER	DRIVE SIZE
9050-00	0
9050-01	1
9050-02	2
9050-03	3
9050-04	4



Universal's Square Drive Penetration Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify: Inch or Metric Dial Indicator; SPC-Compatible With Digital Indicators.



## #9052 TWELVE-POINT PENETRATION GAGES

FOR INTERNAL 12-POINT™ RECESS HEAD SCREWS  
EUROPEAN AUTOMOTIVE STANDARDS

PART NUMBER	DRIVE SIZE
9052-04	M4
9052-05	M5
9052-06	M6
9052-08	M8
9052-10	M10
9052-12	M12
9052-14	M14
9052-16	M16



Universal's 12-Point™ Penetration Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify: Inch or Metric Dial Indicator; SPC-Compatible With Digital Indicators.

## #9053 TWELVE-POINT GO-NOGO GAGES

FOR INTERNAL 12-POINT RECESS HEAD SCREWS  
EUROPEAN AUTOMOTIVE STANDARDS

PART NUMBER	DRIVE SIZE
9053-04	M4
9053-05	M5
9053-06	M6
9053-08	M8
9053-10	M10
9053-12	M12
9053-14	M14
9053-16	M16



Universal's 12-Point™ Go-NoGo Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

## #9055 HEXAGON GO-NOGO GAGES

FOR SOCKET CAP, SHOULDER AND SET SCREWS  
ANSI/ASME B18.3 STANDARDS

PART NUMBER	HEX SIZE
9055-06	1/16"
9055-07	5/64"
9055-09	3/32"
9055-10	7/64"
9055-12	1/8"
9055-14	9/64"
9055-15	5/32"
9055-18	3/16"
9055-21	7/32"
9055-25	1/4"
9055-31	5/16"
9055-37	3/8"
9055-43	7/16"
9055-50	1/2"
9055-56	9/16"
9055-62	5/8"
9055-75	3/4"
9055-87	7/8"



Universal's Hexagon Go-NoGo Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

## #9075 METRIC HEXAGON GO-NOGO GAGES

ANSI B18.3.1M

FOR SOCKET CAP, SHOULDER AND SET SCREWS  
ANSI/ASME 18.3.1M STANDARDS

PART NUMBER	HEX SIZE
9075-0.7	0.7mm
9075-0.9	0.9mm
9075-1.3	1.3mm
9075-1.5	1.5mm
9075-2.0	2.0mm
9075-2.5	2.5mm
9075-3.0	3.0mm
9075-4.0	4.0mm
9075-5.0	5.0mm
9075-6.0	6.0mm
9075-8.0	8.0mm
9075-10	10mm
9075-12	12mm
9075-14	14mm
9075-16	16mm
9075-17	17mm
9075-19	19mm
9075-22	22mm
9075-24	24mm



Universal's Hexagon Go-NoGo Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

## FOR SOCKET CAP, SHOULDER AND SET SCREWS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	HEX SIZE	ISO4762 (DIN912) JIS1176	ISO4762 (DIN7991) JIS1194	ISO 4026/4028 (DIN 913/916) JIS1177
9076-0.7	0.7mm	-	-	M1.4/M1.6/M1.8
9076-0.9	0.9mm	-	-	M2
9076-1.3	1.3mm	M1.4	-	M2.5
9076-1.5	1.5mm	M1.6/M2	-	M3
9076-2.0	2mm	M2.5	M3	M4
9076-2.5	2.5mm	M3	M4	M5
9076-3.0	3mm	M4	M5	M6
9076-4.0	4mm	M6	M6	M8
9076-5.0	5mm	M6	M8	M10
9076-6.0	6mm	M8	M10	M12/14
9076-8.0	8mm	M10	M12	M16
9076-10	10mm	M12	M14/M16	M18/M20
9076-12	12mm	M14	M18/M20	M22/M24
9076-14	14mm	M16/M18	M22/M24	-
9076-16	16mm	-	-	-
9076-17	17mm	M20/M22	-	-
9076-19	19mm	M24/M27	-	-
9076-22	22mm	M30	-	-
9076-24	24mm	M33	-	-



Universal's Hexagon Go-NoGo Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

# #9080 TYPE 1 MASTER PLUG GAGES

ANSI B107.600

## TYPE I PHILLIPS (PH) DRIVERS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
9080-00	0
9080-01	1
9080-02	2
9080-03	3
9080-04	4



Universal's Type1 Plug Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

# #9081 TYPE 1 GO-NOGO RING GAGE

ANSI B107.600

## TYPE I PHILLIPS (PH) DRIVERS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
9081-00	0
9081-01	1
9081-02	2
9081-03	3
9081-04	4



The Ring Gage, Also Known As A Step Gage, Is To Be Used As A Working Gage And Checked With A Master Plug Gage Periodically. Universal's Type1 Wafer Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

# #9082 TYPE 1 TEST BLOCK

ANSI B107.600

## TYPE I PHILLIPS (PH) DRIVERS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
9082-00	0
9082-01	1
9082-02	2
9082-03	3
9082-04	4



Universal's Type1 Test Blocks Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

# #9083 PENETRATION GAGE ASSEMBLY

ANSI B107.600

## TYPE I PHILLIPS (PH) DRIVER ENGAGEMENT ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
9083-00	0
9083-01	1
9083-02	2
9083-03	3
9083-04	4



This System Provides Actual Measurements Of Driver Penetration As It Relates To A Master Plug Gage. Universal's Type1 (PH) Penetration Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify Inch or Metric Dial Indicator; SPC-Compatible With Digital Indicators.

# #9085 TYPE IA (PZ) MASTER PLUG GAGES

ANSI B107.600

## TYPE IA POZI (PZ) DRIVERS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
9085-00	0
9085-01	1
9085-02	2
9085-03	3
9085-04	4



Universal's Type1A Plug Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

# #9086 TYPE IA (PZ) GO-NOGO RING GAGE

ANSI B107.600

## TYPE IA POZI (PZ) DRIVERS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
9086-00	0
9086-01	1
9086-02	2
9086-03	3
9086-04	4



The Ring Gage, Also Known As A Step Gage, Is To Be Used As A Working Gage And Checked With A Master Plug Gage Periodically. Universal's Type 1A (PZ) Wafer Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

# #9087 TYPE IA (PZ) TEST BLOCK

ANSI B107.600

## TYPE IA POZI (PZ) DRIVERS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
9087-00	0
9087-01	1
9087-02	2
9087-03	3
9087-04	4



Universal's Type 1A (PZ) Test Blocks Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

# #9088 PENETRATION GAGE ASSEMBLY

ANSI B107.600

## TYPE IA POZI (PZ) DRIVER ENGAGEMENT ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	RECESS SIZE
9088-00	0
9088-01	1
9088-02	2
9088-03	3
9088-04	4



This System Provides Actual Measurements Of Driver Penetration As It Relates To A Master Plug Gage. Universal's Type 1A (PZ) Penetration Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology. When Ordering Specify Inch or Metric Dial Indicator; SPC-Compatible With Digital Indicators.



## #9090 SQUARE MASTER PLUG GAGES

FOR SQUARE RECESS HEAD SCREWS  
ROBERTSON SQUARE RECESS STANDARDS

PART NUMBER	RECESS SIZE
9090-00	0
9090-01	1
9090-02	2
9090-03	3
9090-04	4

Universal's Square Plug Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.



## #9091 SQUARE GO-NOGO WAFER GAGES

FOR SQUARE DRIVERS  
ROBERTSON SQUARE RECESS STANDARDS

PART NUMBER	RECESS SIZE
9091-00	0
9091-01	1
9091-02	2
9091-03	3
9091-04	4

Universal's Square Wafer Gages Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.



## FOR KEYS, DRIVER BITS & SCREWDRIVERS TMF/TMD-821 CAMCAR STANDARDS

PART NUMBER	RECESS SIZE	PART NUMBER	RECESS SIZE
9096-01	1	9096-60	60
9096-02	2	9096-70	70
9096-03	3	9096-80	80
9096-04	4	9096-90	90
9096-05	5	9096-100	100
9096-06	6		
9096-07	7		
9096-08	8		
9096-09	9		
9096-10	10		
9096-15	15		
9096-20	20		
9096-25	25		
9096-27	27		
9096-30	30		
9096-40	40		
9096-45	45		
9096-50	50		
9096-55	55		



Universal's 6-lobe (TX) Torsional Test blocks Are Heat Treated, Thermally Stabilized, And Surface Treated To Provide Additional Wear To Maximize Gage Life. All Gages Are Calibrated To Dimensions And Tolerances As Specified And Are Traceable To (NIST) National Institute Of Standards And Technology.

## #9100 PENETRATION GAGING STATIONS

### FOR CROSS RECESSED HEAD SCREWS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
9100-12	12 PROBE PENETRATION GAGING STATION
575-123	IDU DIGITAL INDICATOR, RG. .5"/12.7mm RES. .0005"/0,01mm
905-338	SPC CONNECTING CABLE (1M)
264-503	DIGIMATIC MINIPROCESSOR RECORDER
937-179	FOOT SWITCH

Universal Penetration Gaging Stations provide an organized system utilizing one electronic digital indicator to measure the penetration depth of recesses in fasteners. Designed for the shop floor or inspection room use, all steel parts are hard chrome plated for durability in harsh environments. With the quick-change feature you can conveniently change probe assemblies, reducing inspection time. The system has SPC output capability and may be attached to most data processors.



## #9200 WOBBLE GAGES

### FOR CROSS RECESSED HEAD SCREWS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
9200-00	WOBBLE GAGE UNIT WITH KEYLESS CHUCK
9200-01	PLUG GAGE HANDLE 0, 1 & 2 SIZES
9200-02	PLUG GAGE HANDLE 3 & 4 SIZES
9200-10	EXTRA CROSS LINE POINTERS FOR 0, 1 & 2 SIZES
9200-15	EXTRA CROSS LINE POINTERS FOR 3 & 4 SIZES

the Wobble Gage provides a means for determining the compatibility of cross recesses in the heads of screws with companion screw drivers and will indicate the point where deviation in the recess contours affects satisfactory driver engagement. Recesses which exhibit excessive wobble characteristics will cause poor screw driveability because of drive camout prior to attaining normal torque level, damage to recess, and/or accelerated driver wear. Recess wobble gage fixture requires plug gages, gage handles and pointers Specify when ordering.

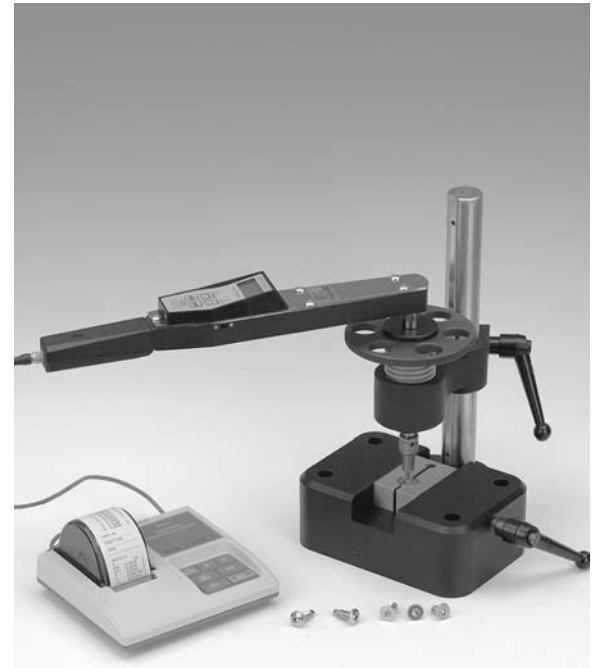


## #9300 TORSIONAL TESTING FIXTURES

### FOR FASTENER TORSIONAL STRENGTH TESTING ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
9300-25	1/4" FIXTURE, 3/8" DRIVE, 0-200 IN/LBS. / 0-22 NM
9300-31	3/8" FIXTURE, 3/8" DRIVE, 0-900 IN/LBS. / 0-101 NM
9300-50	1/2" FIXTURE, 1/2" DRIVE, 0-150 FT/LBS. / 0-203 NM
930100	COLLET HOLDERS
932000	SPLIT COLLETS FOR MACHINE SCREWS
933000	SPLIT COLLETS FOR SHEET METAL SCREWS
933200	SOCKET DRIVER BIT HOLDERS
933300	DRIVER BITS
933400	DIAL TORQUE WRENCHES
933500	DIGITAL TORQUE WRENCHES FOR SPC
933600	TEST PLATE HOLDERS
933700	TEST PLATES

Universal offers three fixtures to choose from that meet the performance requirements for tapping and machine screws covered by ANSI/ASME, Aerospace, Automotive and ISO standards. Universal can provide all of the testing attachments and accessories that are needed to perform these tests including standard or electronic torque wrenches for digital output of data.



## #9400 RECESS TORSIONAL STRENGTH FIXTURES

### FOR RECESS TORSIONAL STRENGTH TESTING MILITARY AND AEROSPACE STANDARDS

PART NUMBER	PART DESCRIPTION
9400-00	PIVOTING WEIGHT SYSTEM
9400-31	3/8" FIXTURE, 3/8" DRIVE, 0-900 IN/LBS. / 0-101 NM
943200	SOCKET DRIVER BIT HOLDERS
943300	DRIVER BITS
943325	WEIGHTS SET-5 OR 10 POUND INCREMENTS
943400	DIAL TORQUE WRENCHES
943500	DIGITAL TORQUE WRENCHES FOR SPC

This fixture meets the performance requirements for testing #6 through 1/2" screws that are covered by aerospace and other similar specifications. Universal can provide all of the testing attachments and accessories that are needed to perform these tests including drivers bits, weights, and standard or electronic torque wrenches for digital output OF data. When Ordering specify requirements.

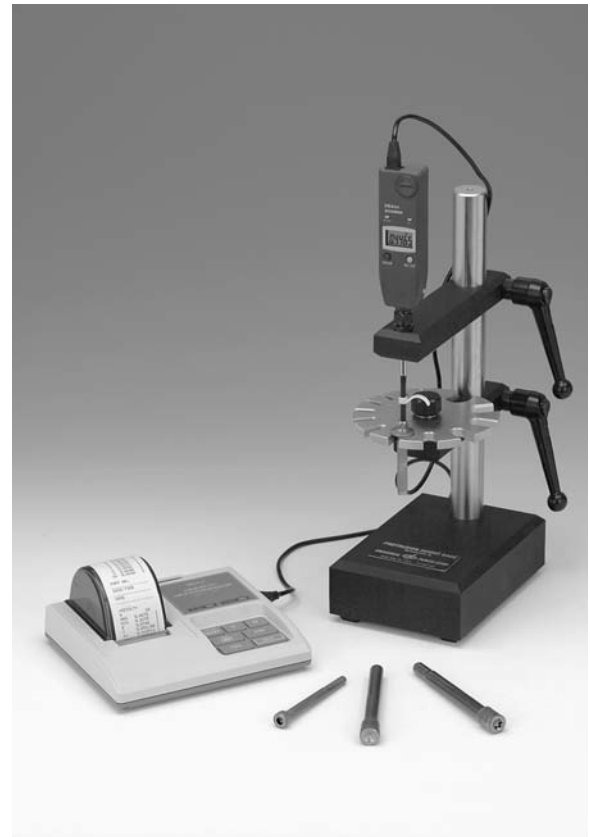


## #9450 PROTRUSION HEIGHT GAGES

### FOR MEASURING FASTENER HEAD HEIGHTS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
9450-00	PROTRUSION HEIGHT GAGE
9450-01	82° GAGING PLATE: #2 THROUGH 3/8"
9450-02	100° GAGING PLATE: #2 THROUGH 3/8"
9450-03	ISO 90° GAGING PLATE: M2 THROUGH M10
9450-04	BOLT GAGING PLATE: #4 THROUGH 3/4"
9450-05	ISO BOLT GAGING PLATE: M3 THROUGH M20
358-000	3/8" FLAT PROBE (CARBIDE FACE)
307-050	1/2" (13MM) PROBE EXTENSION
540-774	REMOTE SPINDLE LIFTER CABLE
575-123	IDU DIGIMATIC INDICATOR RES. .0005"/0,012mm / W/SPC
264-503	DP1HS DIGIMATIC MINIPROCESSOR/RECORDER

This gaging fixture can be set up to measure all types of fastener attributes such as head heights, body diameters, across flats, across corners, and lengths. The interchangeable gaging plates are offered in both inch and metric sizes, certified and conforming to ANSI/ASME and ISO standards. The gaging plates are stainless steel, heat treated, and thermally stabilized. Universals Gaging Plate hole sizes are measured by "height over ball" method and calculated to the actual sizes.



## #9455 NAS PROTRUSION HEIGHT GAGES

### FOR MEASURING FASTENER HEAD HEIGHTS NATIONAL AEROSPACE STANDARDS

PART NUMBER	PART DESCRIPTION
9455-00	NAS PROTRUSION HEIGHT GAGE
9455-06	INSERT GAGE PLATE (SIX PLACE)
9455-10	INTERCHANGEABLE INSERT W/BUSHING (SPECIFY HOLE SIZE)
543 552	DIGIMATIC INDICATOR 1"/25.4mm RES. .00005"/0,001mm,
331028	NAS526 INDICATOR STYLUS FOR SIZES 1, 2, 3 & 4

Provides a fast, accurate and repeatable means to measure fasteners and related products. Designed to be used in harsh manufacturing environments. Steel parts are hard chrome plated for durability. This multipurpose gaging fixture can be set up to measure all types of aerospace and special fasteners. The interchangeable gaging bushings are offered in both inch and metric sizes, certified and conforming to ANSI/ASME, ISO, and NAS standards. The gaging bushings are made from high speed steel, heat treated, thermally stabilized, and hard chrome plated for wear. Gaging bushing hole sizes are measured by "height over ball" method and calculated to the actual sizes.



## #9470 DIGITAL NUT MEASURING GAGES

### FOR MEASURING NUT TYPE PRODUCTS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
9470-00	DIGITAL NUT MEASURING GAGE 0 - 2"/50mm
9470-02	CONTACT ANVILS
905338	SPC CONNECTING CABLE (1M)
264503	DP1HS DIGITAL MINIPROCESSOR/RECORDER
167141	1"/25mm STANDARD LENGTH MASTER

This portable lightweight gage provides a fast, accurate and repeatable way to measure the outside dimensions of nut type products. Specifically designed with a digital scale for SPC, this gage is portable, yet durable, to be used in harsh manufacturing environments. The slide rod assembly and constant spring force ensure precise measurements throughout the entire range of travel. This multipurpose gaging fixture can be used for measuring across flats (AF), across corners (AC), thicknesses, Bearing face diameters, flange diameters, and tapers.

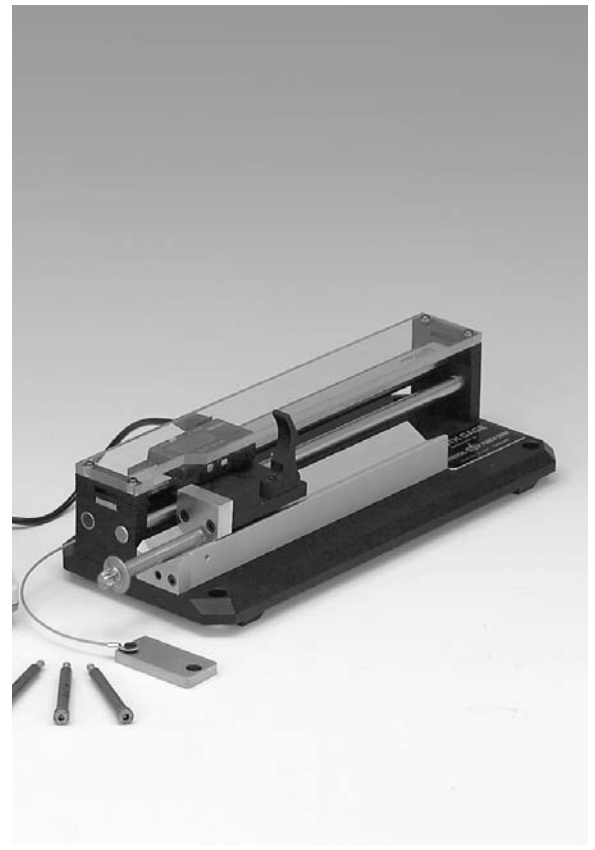


## #9475 DIGITAL FASTENER LENGTH GAGES

### FOR MEASURING FASTENER LENGTHS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
9475-04	DIGITAL FASTENER LENGTH GAGE 4"/102mm
9475-08	DIGITAL FASTENER LENGTH GAGE 8"/203mm
9475-12	DIGITAL FASTENER LENGTH GAGE 12"/300mm
947501	MEASURE ANVIL FOR SHOULDER BOLTS SCREWS
905409	SPC CONNECTING CABLE (1M)
264503	DPIHS DIGITAL MINIPROCESSOR/RECORDER
937179	FOOT SWITCH
167146	LENGTH CALIBRATION MASTER 6"/152mm
167148	LENGTH CALIBRATION MASTER 8"/203mm

These Digital Length Gages are light-weight, yet durable, unit that provides a fast, accurate, and repeatable means to measure fasteners and related products. The slide rod assembly ensures close alignment throughout the entire measuring range. This system concentrates force onto supported bearing surfaces thereby minimizing any load transfer to the scale unit and increasing its service life. The length gage is designed for the shop floor or inspection room use. This system offers an alternative to calipers, scales, and other devices and has SPC output capability.



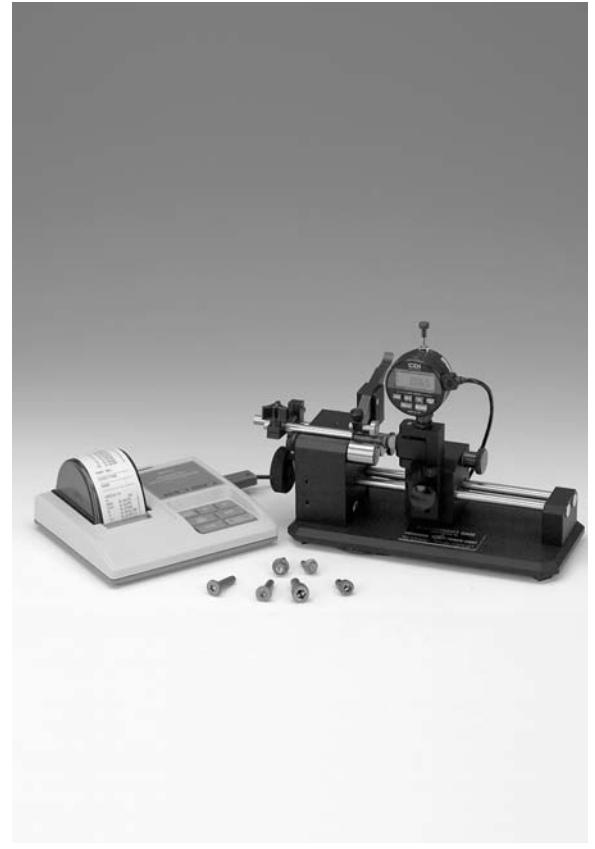


## #9500 FASTENER RECESS CHECKER GAGES

### FOR MEASURING FASTENER DRIVES ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
9500-00	FASTENER RECESS CHECKER GAGE™
950110	FULL PLAIN ROLLERS
950302	O.D. HEX CHECKING ATTACHMENT
950312	BACK STOP
952600	CDI DIGITAL INDICATOR FOR T.I.R. W/SPC OUTPUT
230019	CABLE FOR DPIHS MINIPROCESSOR / RECORDER
264-503	DPIHS MINIPROCESSOR/RECORDER

This gage model has been specifically designed to measure misalignment/runout for both external and internal fastener drives. This gage offers a quick, accurate, and repeatable way to measure fastener recess runout without using collets. The single element probe uses one carrier with an indicator to inspect all types of fastener drive recesses from #4/M2 thru 1/2"/M12. An optional External Drive Checker™ attachment can be purchased separately for inspecting external drives. This item can be installed for inspection applications requiring larger motions of travel, such as across flats and across corners of a hexagon bolt. By mounting an Electronic Indicator, SPC data can be down loaded to most data collectors.

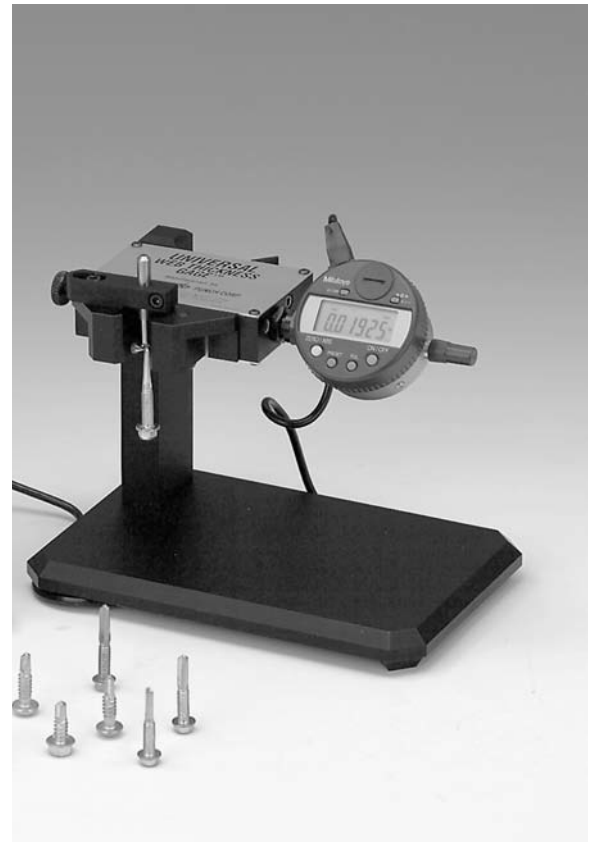


## #9600 WEB THICKNESS GAGES

### FOR MEASURING SELF DRILLING/TAPPING SCREWS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
9600-01	WEB THICKNESS GAGE
9600-02	BASE PLATE AND MOUNTING POST
9600-05	CARBIDE SHARP POINTS
9600-31	CARBIDE BALL POINTS .031/0,78mm
9600-46	CARBIDE BALL POINTS .046/1,16mm
9600-62	CARBIDE BALL POINTS .062/1,57mm
600010	DIAL INDICATOR .500" RANGE / .001" GRAD.
600020	DIAL INDICATOR 0,002mm RANGE / 12mm GRAD.
543683	DIGITAL INDICATOR FOR SPC .0005"/0,01mm
905338	SPC CONNECTING CABLE
264503	DPIHS MINIPROCESSOR/RECORDER

This Drill Point Web Thickness Gage provides a fast, accurate, and repeatable way to measure the drill point dimensions of self drilling screws. Specifically designed for mechanical or digital indicators, this gage has a range of 0" to 3/8" / 9.5mm. This gage is portable, yet durable, to be used in harsh manufacturing environments. Standard protected precision stroke bearings and a repeatable spring force ensure precise measurements throughout the entire range of travel.





## #9700 TRI-LOBE™ GAGES

### FOR MEASURING TAPTITE® SCREWS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
9700-01	TRI-LOBE™ GAGE FRAME
9700-03	SINGLE STAND
9700-05	60 DEGREE TRI-LOBE™ ELEMENTS
PG2600	SPECIAL RATIO DIGITAL INDICATOR WITH SPC .0001"/0,001mm
905338	SPC CONNECTING CABLE
264503	DPIHS MINIPROCESSOR/RECORDER

TRI-LOBE™ gage provides a fast, accurate and repeatable way to measure the “C” dimensions of Taptite® screws. Specifically designed for a mechanical or digital dial for SPC, this gage has a diameter range from #4 Through 3/4” (M3 - M19). This gage is portable, yet durable to be used in harsh manufacturing environments. Protected precision stroke bearings assembly and a repeatable spring force ensure precise measurements throughout the entire range of travel.



## #9800 COMPARATOR MAJOR GAGES

### FOR MEASURING SCREW OR PREFORM BLANKS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
9800-01	MAJOR GAGE™
9800-03	SINGLE STAND
9800-05	CARBIDE ANVILS
543-683	DIGITAL INDICATOR FOR SPC .0005"/0,01mm
543-452	DIGITAL INDICATOR FOR SPC .0001"/0,001mm
900525	SPINDLE LIFTING LEVER (ANSI/AGD TYPE)
903424	SPINDLE LIFTING LEVER (ISO/JIS TYPE)
905338	SPC CONNECTING CABLE
264503	DPIHS MINIPROCESSOR/RECORDER

This simple to use gage provides a fast, accurate, and repeatable way to measure fastener screw blank diameters and fastener dimensions. Specifically designed for a mechanical or digital dial indicator for SPC. this gage has a diameter range from .100"/2,5mm to 1"/25mm. standard features are adjustable reference stop, carbide anvils, and spindle lifting levers. durable to be used in harsh manufacturing environments.



# #10000 FASTENER GAGING STATIONS

## FOR MEASURING FASTENER SCREWS ISO, DIN, IFI AND JIS STANDARDS

PART NUMBER	PART DESCRIPTION
10000-02	NUT GAGING STATION
10000-03	BOLT GAGING STATION
10000-04	SCREW GAGING STATION
575-123	IDU DIGITAL INDICATOR 0.5"/12.7mm
543-683B	IDC DIGITAL INDICATOR 0.5"/12.7mm
543-456B	IDC DIGITAL INDICATOR 1"/25.4mm
543-566B	IDC DIGITAL INDICATOR 2"/50.8mm
905338	SPC CONNECTING CABLE (1M/40")
264503	DPIHS MINIPROCESSOR RECORDER



Universal Fastener Gaging Stations can provide a fast, accurate and repeatable way to measure production nuts, screws, and rivets. designed for mechanical or digital indicators for SPC data collection, each station can be configured for different product groups and sizes that range from #4(M2.5) Through 3/4"(M20). Each gaging station can be secured and is durable enough to be used in harsh manufacturing environments.

## #10010 UNIVERSAL FINISHED CARBIDE REAMERS

### FINISHED GROUND "READY TO CUT" FOR GENERAL APPLICATIONS

PART NUMBER	REAMING SIZE	SHANK OD x LENGTH	CARBIDE TIPS	SHANK LENGTH
10010	.062 - .079	1/16 x 4	1/64 x 3/16	4.0
10011	.080 - .094	5/64 x 4	1/32 x 1/4	4.0
10012	.095 - .102	.085 x 4	1/32 x 1/4	4.0
10013	.103 - .125	3/32 x 4	1/32 x 1/4	4.0
10014	.126 - .156	7/64 x 4	3/64 x 1/4	4.0
10015	.157 - .187	1/8 x 4	1/16 x 5/16	4.0
10016	.188 - .218	5/32 x 5	5/64 x 3/8	5.0
10017	.219 - .250	3/16 x 5	5/64 x 3/8	5.0
10018	.251 - .281	7/32 x 5	3/32 x 3/8	5.0
10019	.282 - .312	7/32 x 5	3/32 x 3/8	5.0
10020	.313 - .343	1/4 x 5	1/8 x 7/16	5.0
10021	.344 - .375	9/32 x 5	1/8 x 7/16	5.0
10022	.376 - .437	5/16 x 6	1/8 x 1/2	6.0
10023	.438 - .500	11/32 x 6	1/8 x 1/2	6.0
10024	.501 - .562	3/8 x 6	5/32 x 5/8	6.0
10025	.563 - .625	7/16 x 6	5/32 x 5/8	7.0
10026	.626 - .750	1/2 x 7	3/16 x 3/4	7.0
10027	.751 - .880	1/2 x 7	1/4 x 3/4	7.0
10028	.881 - 1.010	1/2 x 7	1/4 x 3/4	7.0
10029	1.011 - 1.135	1/2 x 7	1/4 x 3/4	7.0



Universal's Finished Carbide Reamers, "Ready to Cut", made with a forty-five degree included angle, unless other specified angle.

## #10100 UNIVERSAL UNFINISHED CARBIDE REAMERS

### UNFINISHED BLANK REAMERS FOR GENERAL APPLICATIONS,

PART NUMBER	CARBIDE DIAMETER	SHANK OUTSIDE DIA.	SHANK LENGTH	EXTENDED LENGTH
10050	3/32 (.093)	1/16 (.063)	4.0	-
10051	1/8 (.125)	5/64 (.078)	4.0	-
10052	1/8 (.125)	.085 (.085)	4.0	-
10053	1/8 (.125)	3/32 (.093)	4.0	-
10054	5/32 (.156)	7/64 (.109)	4.0	-
10055	3/16 (.187)	1/8 (.125)	4.0	-
10056	3/16 (.187)	9/64 (.140)	4.0	-
10057	7/32 (.218)	5/32 (.156)	5.0	9.0
10058	1/4 (.250)	3/16 (.187)	5.0	9.0
10059	9/32 (.281)	7/32 (.218)	5.0	9.0
10060	5/16 (.312)	7/32 (.218)	5.0	9.0
10061	11/32 (.343)	1/4 (.250)	5.0	9.0
10062	3/8 (.375)	9/32 (.281)	5.0	9.0
10063	7/16 (.437)	5/16 (.312)	6.0	9.0
10064	1/2 (.500)	11/32 (.343)	6.0	9.0
10065	9/16 (.562)	3/8 (.375)	6.0	9.0
10066	5/8 (.625)	7/16 (.437)	6.0	9.0
10067	3/4 (.750)	1/2 (.500)	7.0	9.0
10068	7/8 (.875)	1/2 (.500)	7.0	9.0
10069	1 (1.000)	1/2 (.500)	7.0	9.0
10070	1-1/8 (1.125)	1/2 (.500)	7.0	9.0



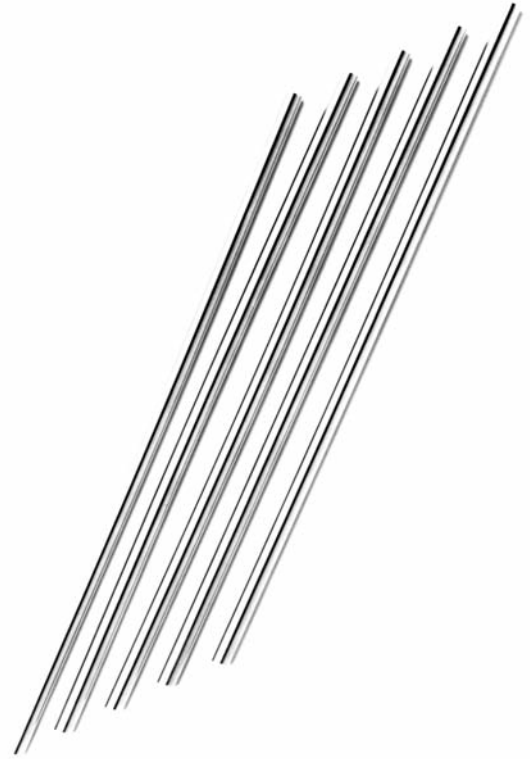
Universal's Unfinished Carbide Reamers, are stocked in two length sizes. For Extended Lengths specified \*(EL) on the end of the part number.

## #10200 UNIVERSAL STICK LAPS

### LAPPING CARBIDE AND STEEL DIE INSERTS LOW CARBON STEEL S.A.E. 1020

PART NUMBER	DIAMETERS FROM / TO		L
			INCH / mm
10201	.055 / .109	1.40 / 2.77	5-7/8" / 149.2
10202	.110 / .160	2.79 / 4.06	5-7/8" / 149.2
10203	.161 / .250	4.09 / 6.35	5-7/8" / 149.2
10204	.251 / .312	6.38 / 7.92	5-7/8" / 149.2
10205	.313 / .375	7.95 / 9.53	5-7/8" / 149.2
10206	.376 / .437	9.55 / 11.10	5-7/8" / 149.2
10207	.438 / .500	11.13 / 12.70	5-7/8" / 149.2

Universal's stick laps are precision ground to close tolerances for use in carbide or steel dies where diamond lapping compounds are used. straighter and rounder holes can be had through the use of stick laps. Special hole configurations (such as angles) are more easily and precisely produced through the use of stick laps. Roundness and taper within .0002" / 0,005mm.



## #10300 UNIVERSAL DIE LAPPING HEAD TOOL

### LAPPING CARBIDE AND STEEL DIES FITS A #2 MORSE TAPER TAIL STOCK

PART NUMBER	PART DESCRIPTION
10310	1/4" DIE LAPPING HEAD TOOL W/ KEYLESS CHUCK
10320	3/8" DIE LAPPING HEAD TOOL W/ KEYLESS CHUCK
10340	1/2" DIE LAPPING HEAD TOOL W/ KEYLESS CHUCK

Universal lapping heads are carried in stock for immediate delivery and are specifically designed for lapping and reaming carbide or steel dies. Quality made from tool steel and heat treated. All component parts have been precision ground and hand fitted to provide years of service.



## #10400 UNIVERSAL HY-PRESS LUBE

**FOR DIE ASSEMBLY AND HOBGING APPLICATIONS WITH EXTREME PRESSURE AGENT**

PART NUMBER	PART DESCRIPTION
10400-1	HY-PRESS LUBE 4 OZ. SIZE
10400-2	HY-PRESS LUBE 8 OZ. SIZE

Universal's unique lubricant is especially formulated for the assembly of the steel or carbides inserts into the die casings. Also for hobbing applications where extreme pressure is required. Its develops a very high film strength that resists breaking down under extreme pressure. Dies will assemble and disassemble with ease. Metal will flow without tearing during extrusion/hobbing processes. This product has proven itself with years of success.



## #10500 UNIVERSAL DIAMOND COMPOUNDS

**FOR DIE LAPPING AND POLISHING ANSI/ASME STANDARDS CWS261-63**

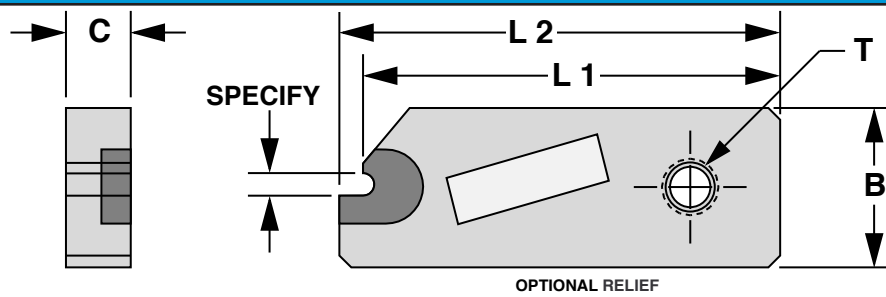
PART NUMBER	GENERAL DESCRIPTION	COLOR CODES	MICRON SIZE	GRIT EQUIVALENT
10500-1	FINE	YELLOW	M-3	8,000
10500-2	MEDIUM FINE	GREEN	M-9	1,800
10500-3	MEDIUM	BLUE	M15	1,200
10500-4	COURSE	RED	M-30	600
10500-5	ROUGHING	BROWN	M-45	320

Universal's Diamond Compounds are the result of many years of research and testing to develop a superior diamond abrasive lapping paste. Pure diamond is the only abrasive in our compound (no fillers or undersized particles to fool you). The diamond powders used are critically graded to exceed the specification of the U.S. standards CWS261-63. The base has high lubricity, acts as a detergent in polishing and does not dry out or ball under lapping pressures. If you want an efficient, tested, and functioning base, by all means try our compound.



# #11000 CARBIDE CUT-OFF KNIVES

HARTFORD HEADERS

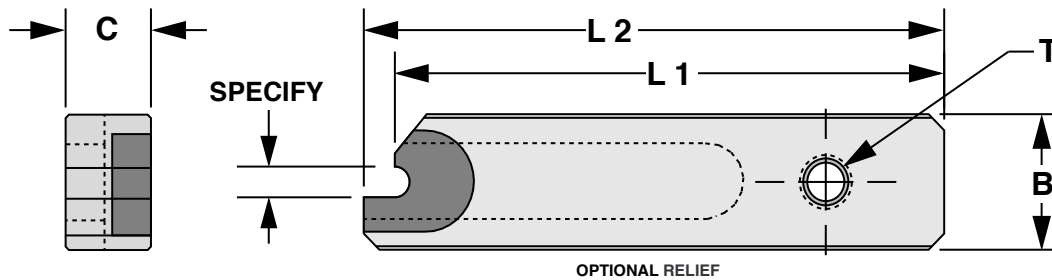


PART NUMBER	MACHINE DESCRIPTION	LENGTH L 1	LENGTH L 2	WIDTH B	THICKNESS C	THREAD SIZE
11001	1/8" HARTFORD 2-425	3.000	3.080	.875	.392	5/16-24
11002	1/8" HARTFORD 2-450	2.680	2.800	.940	.392	5/16-24
11003	3/16" HARTFORD 3-300	3.150	3.270	1.100	.392	3/8-16
	3/16" HARTFORD 3-350	3.150	3.270	1.100	.392	3/8-16
11004	5/16" HARTFORD 4-250	3.545	3.780	1.344	.471	3/8-24
	5/16" HARTFORD 5-250	3.545	3.780	1.344	.471	3/8-24

MATERIAL: TOOL STEEL HARDENED AND GROUND  
 INSERT: CARBIDE 20% CO. WIRE E.D.M. TO YOUR WIRE SIZE.

# #12000 CARBIDE CUT-OFF KNIVES

CARLO SALVI HEADERS

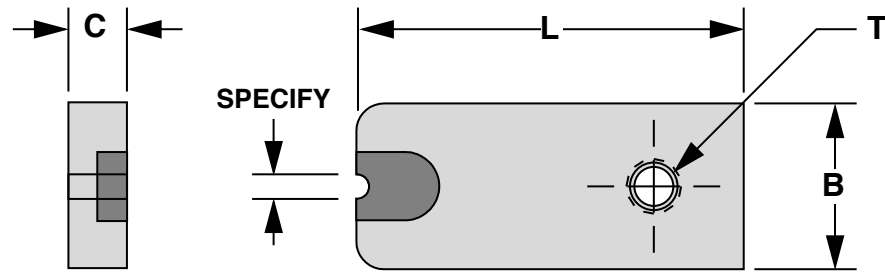


PART NUMBER	MACHINE DESCRIPTION	LENGTH L 1	LENGTH L 2	WIDTH B	THICKNESS C	THREAD SIZE
12001	1/8" PSV - RF/SV	45mm	47mm	12mm	8mm	M5
12002	3/16" 476/SV - RF/476/SV	65mm	67mm	12mm	10mm	M6
12003	1/4" 635/SV - RF/635/SV	90mm	91mm	20mm	12mm	M8
12004	5/16" RF/873/SV	115mm	117mm	25mm	13mm	M12
12005	5/32" TP2/CL - RF/PL	65mm	67mm	12mm	8mm	M6
12006	1/4" INT/CL - RF/ML	90mm	91mm	20mm	11mm	M8

MATERIAL: TOOL STEEL HARDENED AND GROUND  
 INSERT: CARBIDE 20% CO. WIRE E.D.M. TO YOUR WIRE SIZE.

# #13000 CARBIDE CUT-OFF KNIVES

NATIONAL MACHINERY

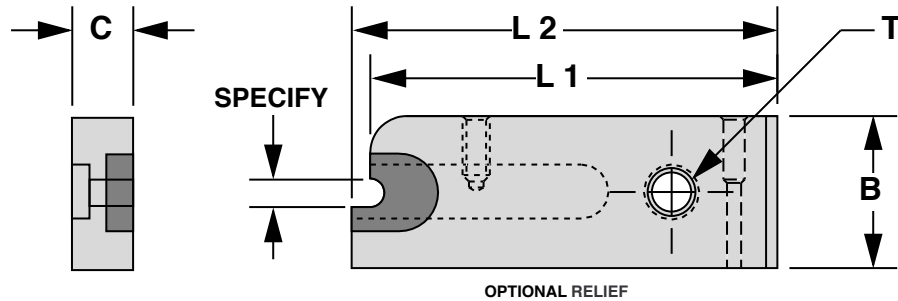


PART NUMBER	MACHINE DESCRIPTION	LENGTH L	WIDTH B	THICKNESS C	THREAD SIZE
13001	1/8" NATIONAL	1.812	.750	.250	3/8-16
13002	3/16" NATIONAL	2.312	1.062	.312	7/16-14
13003	1/4" NATIONAL	3.500	1.375	.375	1/2-13
13004	5/16" NATIONAL	4.000	1.437	.500	5/8-11
13005	3/8" NATIONAL	4.250	1.500	.437	5/8-11
13006	1/2" NATIONAL	5.000	1.875	.562	3/4-10

MATERIAL: TOOL STEEL HARDENED AND GROUND  
 INSERT: CARBIDE 20% CO. WIRE E.D.M. TO YOUR WIRE SIZE.

# #14000 CARBIDE CUT-OFF KNIVES

WATERBURY HEADERS



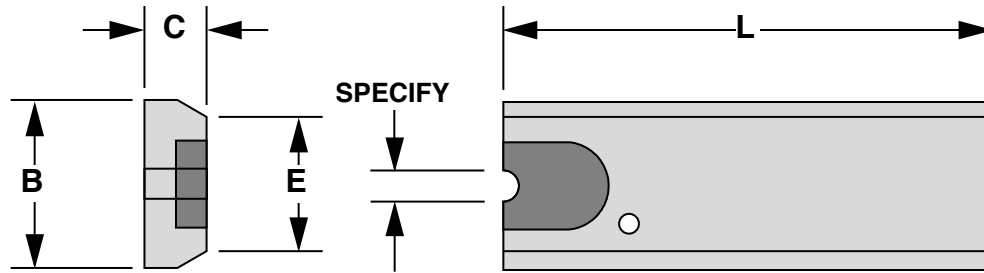
PART NUMBER	MACHINE DESCRIPTION	LENGTH L 1	LENGTH L 2	WIDTH B	THICKNESS C	THREAD SIZE
14001	1/8 HEADMASTER	1.952	2.062	.750	.375	1/4-28
14002	3/16 HEADMASTER	2.457	2.562	1.062	.375	5/16-24
14003	#0 TOGGLE	2.140	2.250	.687	.341	5/16-18
	#0 TUBULAR RIVET	2.140	2.250	.687	.341	5/16-18
14004	#1 TOGGLE	2.457	2.562	1.062	.371	7/16-20
	#1 TUBULAR RIVET	2.457	2.562	1.062	.371	7/16-20
14005	#2 TOGGLE	2.918	3.062	1.375	.371	7/16-20
14006	3/16 HIPRO (10-32)	2.145	2.250	.687	.341	5/16-18
14007	5/16 HIPRO	3.500	3.687	1.437	.500	5/8-11
14008	#10 HIPRO SHORT	2.145	2.250	.687	.341	5/16-18
14009	#10 HIPRO LONG	2.145	2.250	.687	.341	5/16-18
14010	3/16 HIPRO (8-32)	2.145	2.250	.687	.341	5/16-18

MATERIAL: TOOL STEEL HARDENED AND GROUND  
 INSERT: CARBIDE 20% CO. WIRE E.D.M. TO YOUR WIRE SIZE.



# #15000 CARBIDE CUT-OFF KNIVES

NAKASHIMADA HEADERS

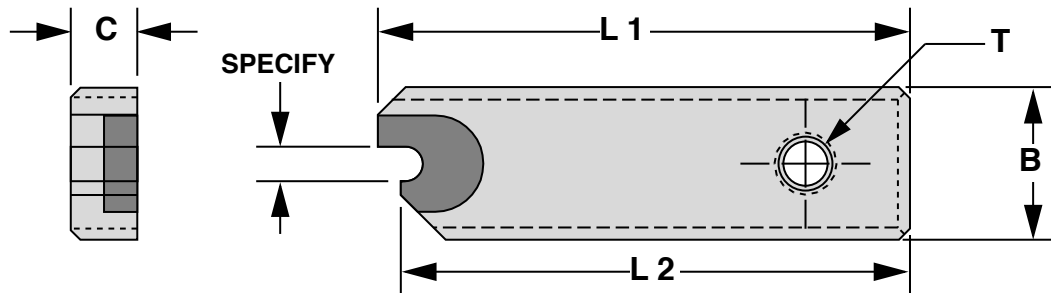


PART NUMBER	MACHINE DESCRIPTION	LENGTH L	THICKNESS B	WIDTH C	FACE E
15001	1/8 H10/H10A	55mm	16mm	5mm	12,24mm
15002	3/16 H15/15A	65mm	20mm	6mm	15,08mm
15003	1/4 H20/20A/20AU/20U/PF6630	70mm	28mm	7mm	21,92mm
15004	1/4 H20C/20E/20F/CS	70mm	28mm	12mm	21,26mm
15005	3/8 H-30/30A	120mm	35mm	20mm	30,94mm
15006	5/16 PF860	90mm	35mm	8,5mm	27,33mm
15007	1/2 PF1280	130mm	45mm	19,8mm	38,70mm

MATERIAL: TOOL STEEL HARDENED AND GROUND  
 INSERT: CARBIDE 20% CO. WIRE E.D.M. TO YOUR WIRE SIZE.

# #16000 CARBIDE CUT-OFF KNIVES

SACMA HEADERS

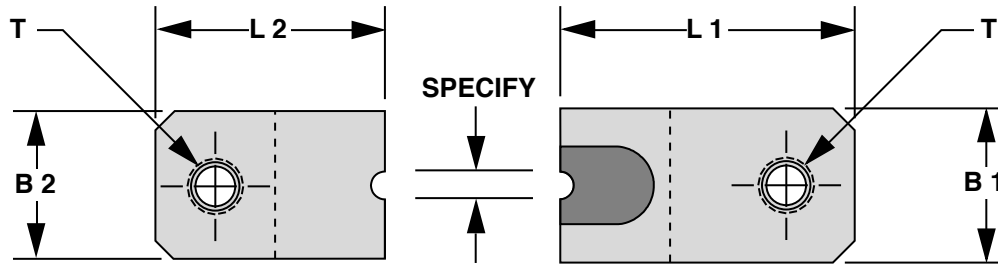


PART NUMBER	MACHINE DESCRIPTION	LENGTH L 1	LENGTH L 2	WIDTH B	THICKNESS C	THREAD SIZE
16001	SACMA SP-01	2.350	2.165	.704	.390	5/16-18
16002	SACMA SP-11	3.300	3.051	.942	.452	3/8-16
16003	SACMA SP-21	3.855	3.543	1.098	.547	1/2-13
16004	SACMA SP-31	5.257	4.882	1.576	.669	5/8-11

MATERIAL: TOOL STEEL HARDENED AND GROUND  
 INSERT: CARBIDE 20% CO. WIRE E.D.M. TO YOUR WIRE SIZE.

# #17000 CARBIDE CUT-OFF KNIVES

WATERBURY HEADERS

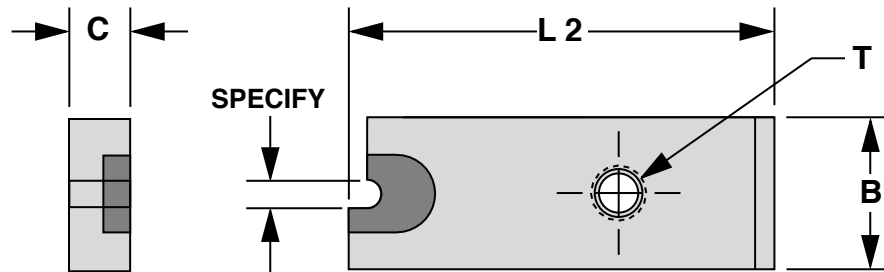


PART NUMBER	MACHINE DESCRIPTION	LENGTH L 1	WIDTH B 1	LENGTH L 2	WIDTH B 2	THREAD SIZE
17001	3/16 WATERBURY	1.687	.812	1.187	.875	5/16-24
17002	1/4 WATERBURY	2.000	1.062	1.437	1.125	3/8-24
17003	5/16 WATERBURY	2.375	1.187	1.687	1.250	5/16-24
17004	3/8 WATERBURY	2.687	1.312	1.937	1.375	1/2-20
17005	1/2 WATERBURY	3.500	1.560	2.437	1.623	5/8-18

MATERIAL: TOOL STEEL HARDENED AND GROUND  
 INSERT: CARBIDE 20% CO. WIRE E.D.M. TO YOUR WIRE SIZE.

# #18000 CARBIDE CUT-OFF KNIVES

CHUN ZU HEADERS



PART NUMBER	MACHINE DESCRIPTION	LENGTH L 2	WIDTH B	THICKNESS C	THREAD SIZE
18001	CH-3 CHUN ZU	55	20	7	M8x1.25
18002	CH-5S,L CHUN ZU	71.5	30	9.5	M8x1.25
18003	CH-6S,L CHUN ZU	68	32	10	M10x1.5
18004	CH-10S,L CHUN ZU	95	36	13	M12x1.75
18005	CH-10LL CHUN ZU	95	38	13/25	M12x1.75
18006	CH-12LL CHUN ZU	150	50	15/15	M16x1.5
18007	CH-20S CHUN ZU	131	55	20/30	M16x1.5
18008	CH-20L CHUN ZU	131	55	20/30	M16x1.5

MATERIAL: TOOL STEEL HARDENED AND GROUND  
 INSERT: CARBIDE 20% CO. WIRE E.D.M. TO YOUR WIRE SIZE.

# UNIVERSAL VARIABLE READING THREAD GAGES



Reducing inspection time- Universal Variable Reading Thread Gaging Systems provide a fast and accurate way to maintain tolerances during the manufacturing process. Measurements of functional size, pitch diameter, minor diameter, major diameter, taper, and circularity can be quickly and accurately determined.

COMPLIANCE TO STANDARDS- Both internal and external variable reading thread gaging systems meet the specifications for Federal, Military, and ANSI/ASME standards.

PROVEN GAGING METHODS- Universal variable thread gaging generates actual measurements of features, allowing qualitative assessment of the inspected characteristic. Measurements obtained can be compared to the tolerance limits to determine trends in manufacturing.

GAGING EFFICIENCY- Knowing the measured value allows operators to make adjustments to the machine more precisely and with less guess work. Variation from part to part can be monitored and adjustments made before limits are exceeded, improving the quality of products.

COST CONSIDERATION- By measuring the position within the assigned tolerances, less time is spent in costly rework, sorting, and remanufacturing. The end result is improved quality and increased profit.

STAND CONFIGURATION- Universal mounting stands and portable handles are quickly and easily set up for use to suit your gaging requirement. A variety of base systems are available for both internal and external thread gaging systems. All are very solid for trouble-free operation and provide the versatility to mount single or multiple gages into one unit.

# UNIVERSAL CONCENTRICITY GAGES

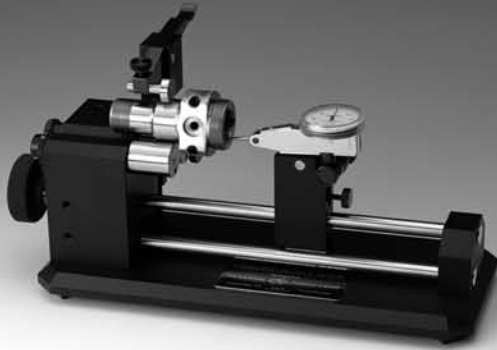
A-10



KK2-10



B-10



G-10



E-10



K1-10



K2-10



J-10-40







**CNC FORM GRINDING**



**CNC TURNING**

Our capabilities allow us to produce custom punches and exotic gaging. Modern CNC Form Grinding, CNC Turning, production CNC milling, wire EDM, conventional EDM, press-type work, and in-house vacuum heat treating facilities allow us to perform for you with speed, reliability and precision.



**CNC PRODUCTION MILLING**



**CNC GRINDING**





Universal Punch Corp., an ISO 9001 registered company, has been a leader in the tooling and gaging industry for over 30 years. As part of our continuing commitment to providing precision and excellence in all of our products we have expanded into a state of the art 65,000 sq.ft. facility. Our spacious new plant is equipped with increased machining capacity, expanded heat treating facilities, calibration and inspection laboratory. Our laboratory ensures that all products sold conform to specifications for ANSI or ISO standards. All measuring equipment and gaging masters are directly traceable to N.I.S.T. All certification processes and procedures conform to ISO 10012 and ISO guide 25. Universal Punch Corp. will be able to service your tooling and gaging requirements well into the twenty first century.



**GAGE CALIBRATION**



**PRECISION MEASURING**



**UNIVERSAL PUNCH CORP.**

4001 W. MACARTHUR BLVD. • SANTA ANA • CALIFORNIA 92704

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