

**REV.  
B**

**AS22520™/23**

**RATIONALE**

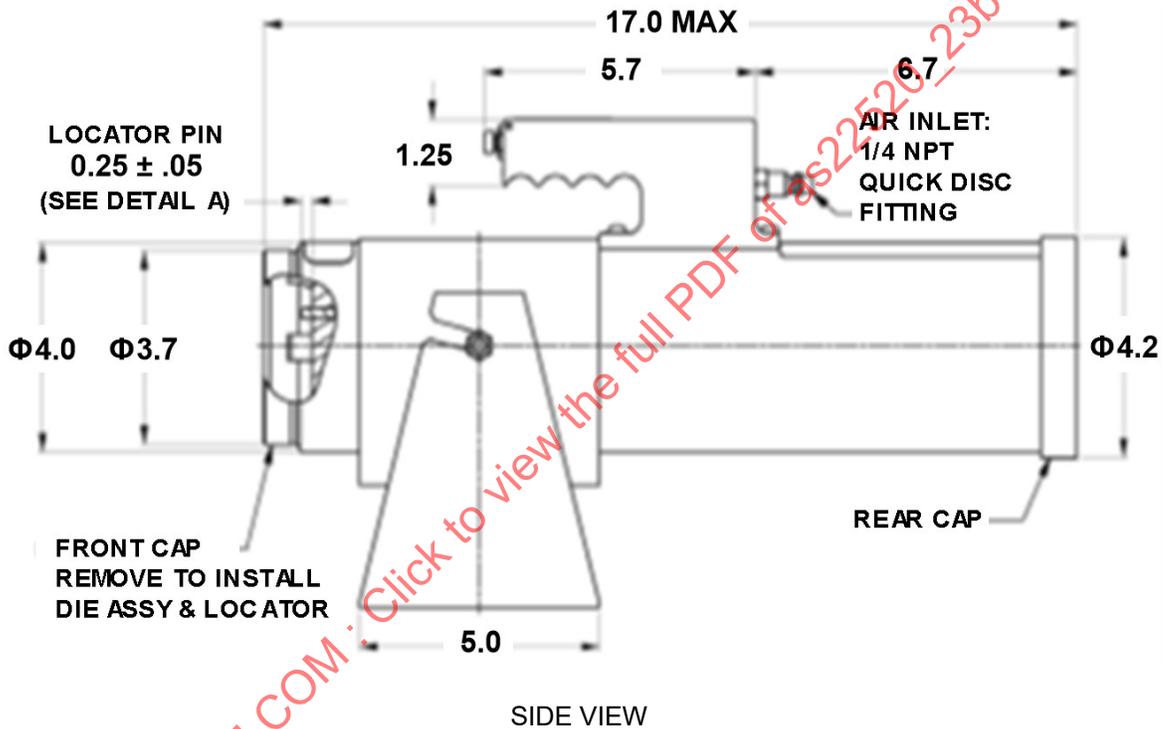
FULL REVISION (MORE THAN 75% CHANGES) REQUIRED TO CLARIFY TABLE 2, CHANGE THE DOCUMENT TITLE, CORRECT EDITORIAL ERRORS, CHANGE TO A CONFIGURATION CONTROL DOCUMENT WITH PERFORMANCE TESTS AS APPLICABLE. TECHNICAL CHANGES ARE PREDICATED ON THE COMPONENT SPECIFICATION DETERMINING THE COMPONENT PERFORMANCE FOR A SPECIFY TOOL.

**NOTICE**

THE COMPLETE REQUIREMENTS FOR PROCURING THE PRODUCT DESCRIBED HEREIN SHALL CONSIST OF THIS DOCUMENT AND THE LATEST ISSUE OF AS22520.

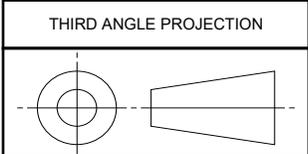
**WARNING**

AS22520/23 IS DESIGNED TO ONLY CRIMP ELECTRICAL CONTACTS CRIMP BARREL SIZES 8 THROUGH 0000 (AS39029, ETC.). THE TOOL IS NOT DESIGNED TO BE USED FOR CRIMPING TERMINALS OR OTHER COMPONENTS.



**FIGURE 1 - M22520/23-01 BASIC TOOL**

For more information on this standard, visit  
<https://www.sae.org/standards/content/AS22520/23B>



ISSUED 2015-01 REVISED 2021-05

CUSTODIAN: AE-8C2

PROCUREMENT SPECIFICATION: AS22520



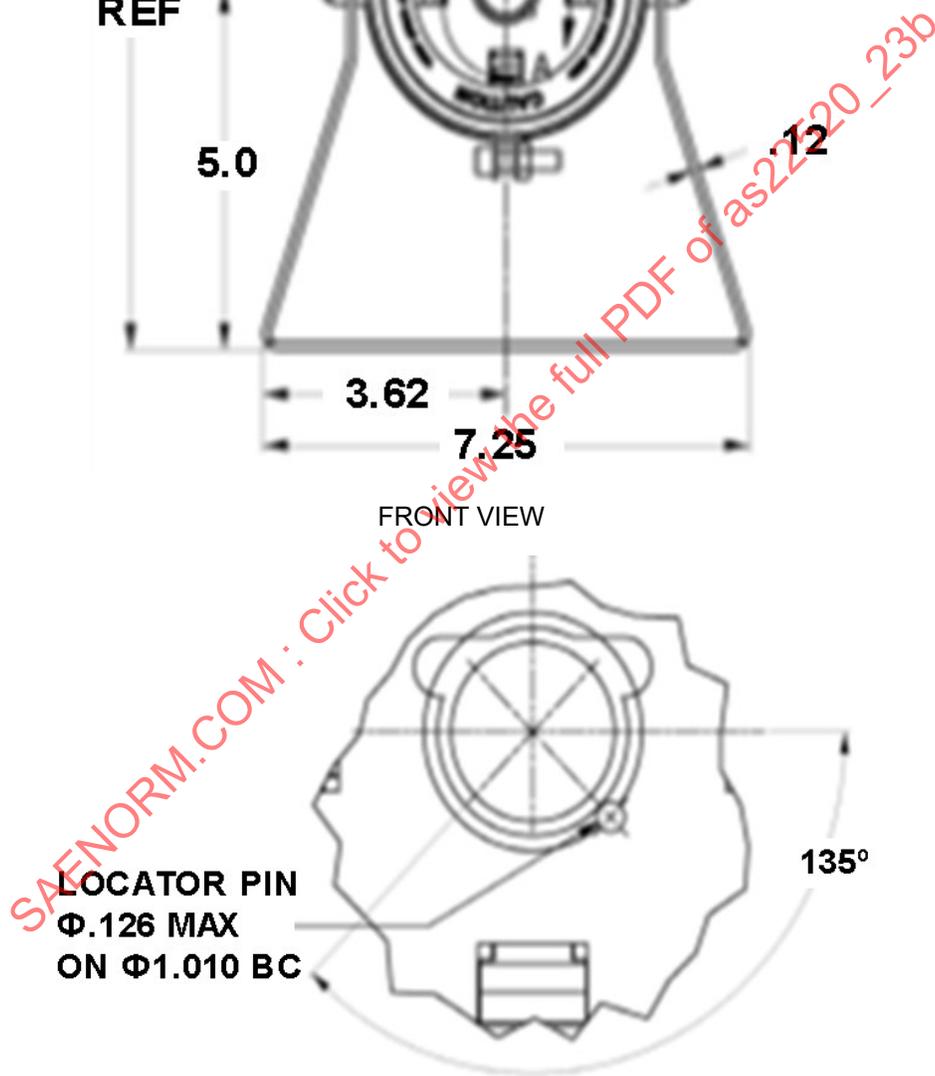
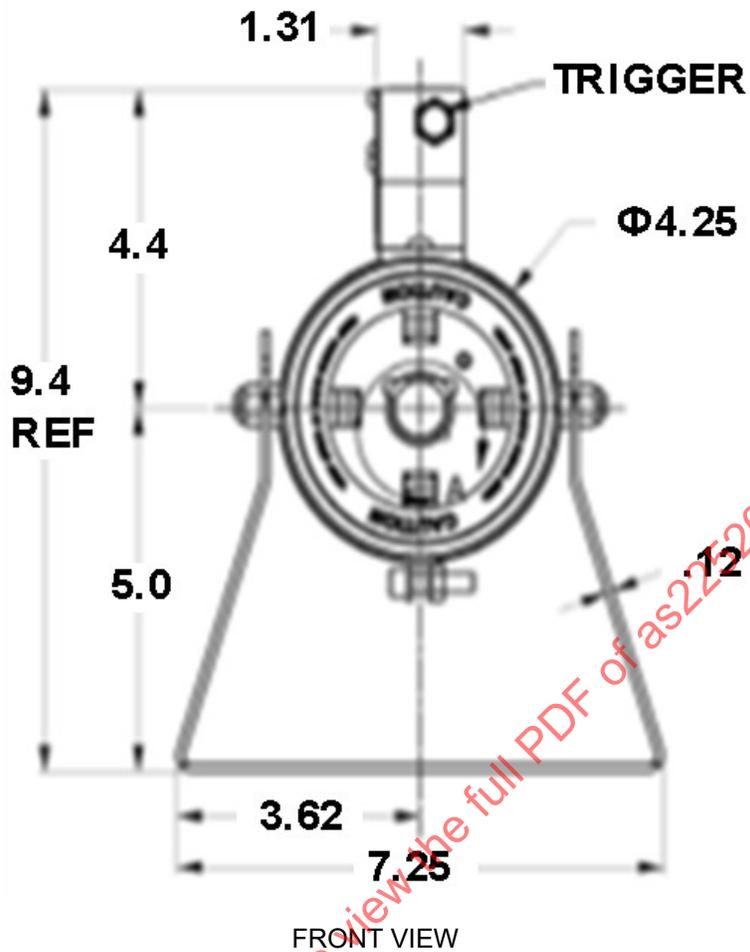
**AEROSPACE STANDARD**

(R) CRIMP TOOLS, TYPE 1, TERMINAL, HAND OR POWER ACTUATED, WIRE TERMINATION, PNEUMATIC TOOL FOR WIRE BARREL SIZES 8 THROUGH 0000

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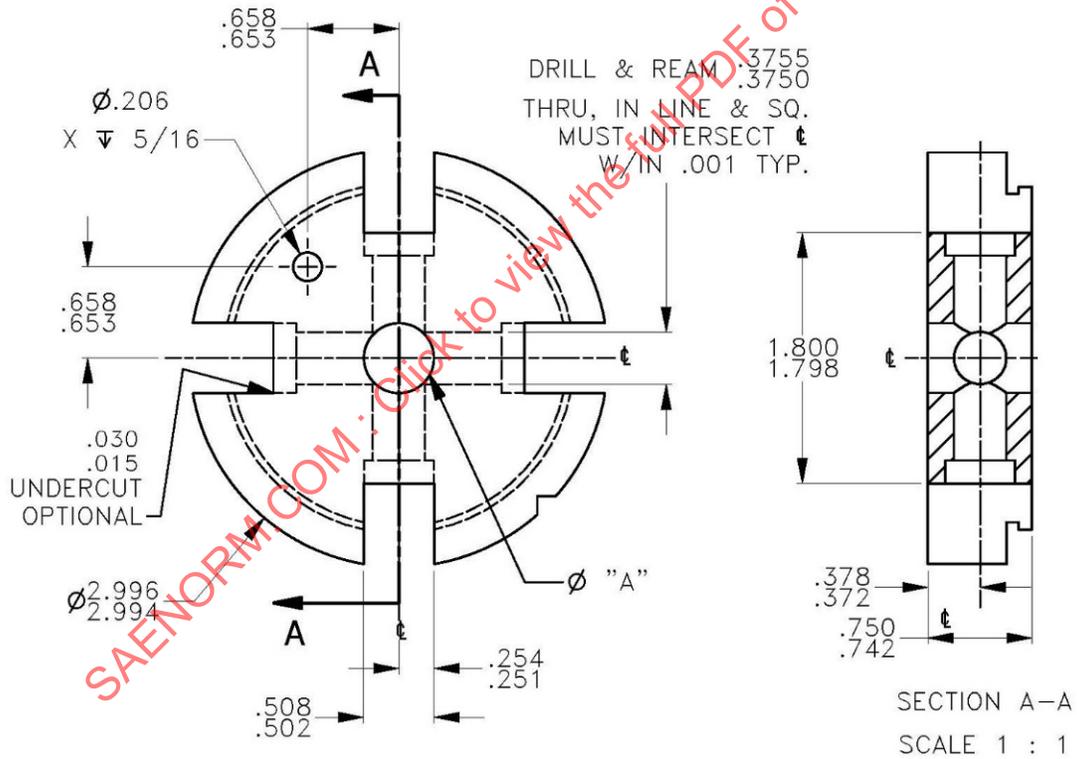
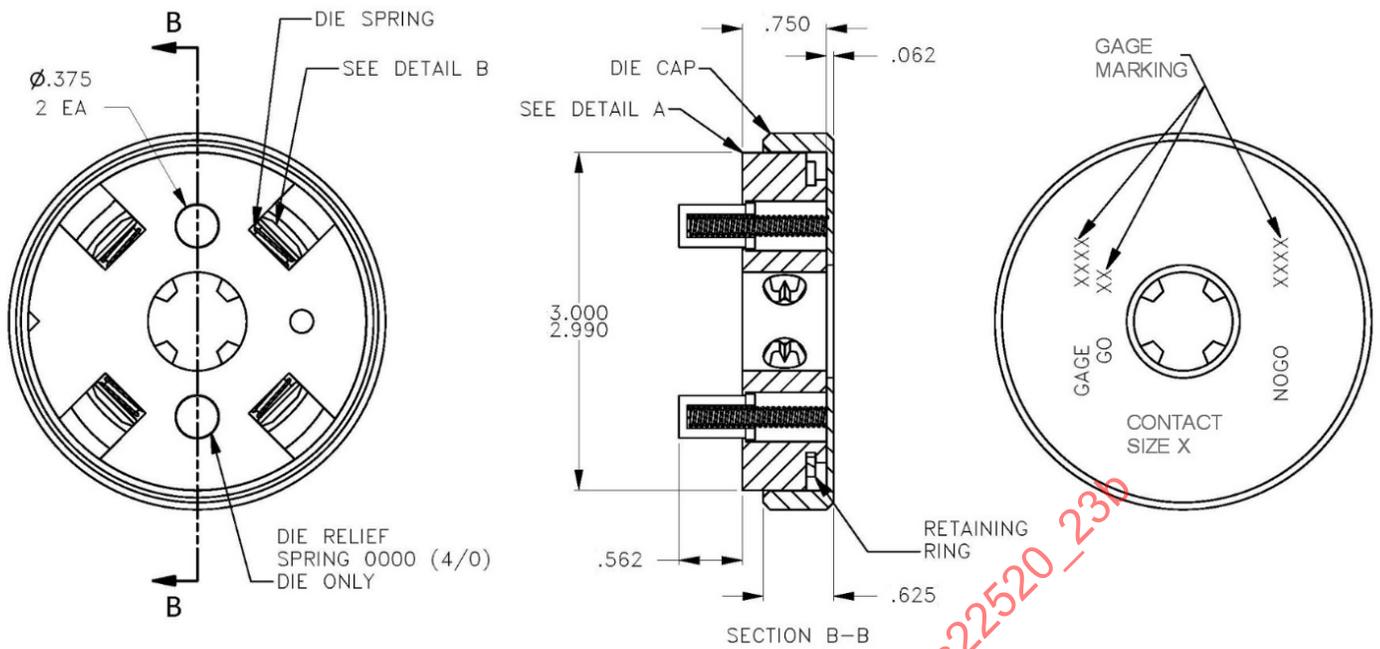
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DETAIL A (SCALE 2:1)

FIGURE 1 - M22520/23-01 BASIC TOOL (CONTINUED)

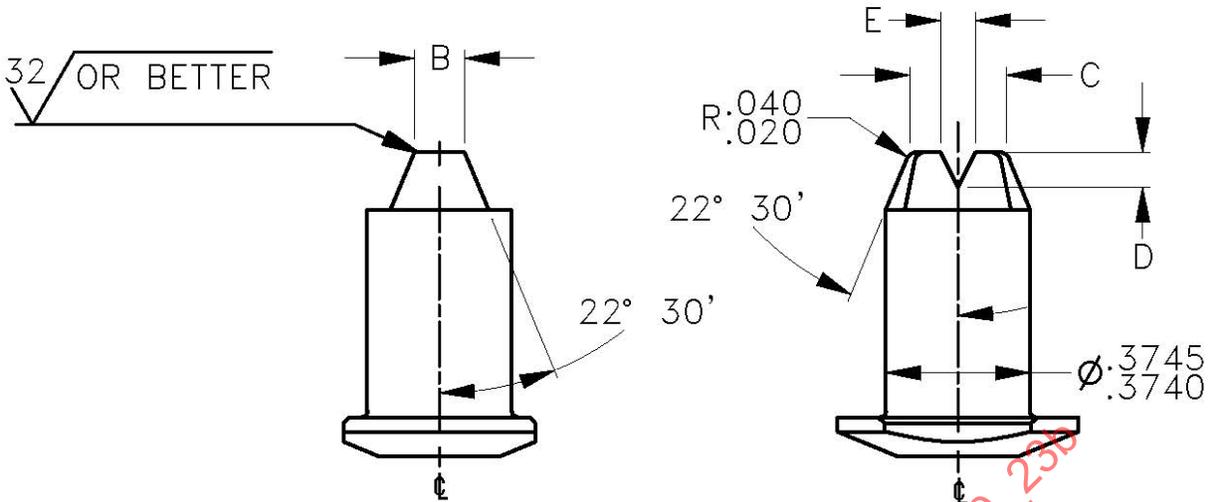
	<b>AEROSPACE STANDARD</b>	<b>AS22520™/23</b> SHEET 2 OF 11	<b>REV.</b> <b>B</b>
	(R) CRIMP TOOLS, TYPE 1, TERMINAL, HAND OR POWER ACTUATED, WIRE TERMINATION, PNEUMATIC TOOL FOR WIRE BARREL SIZES 8 THROUGH 0000		



DETAIL A: INDENTER HOUSING

FIGURE 2 - DIE CAP AND DIE ASSEMBLY

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	(R) CRIMP TOOLS, TYPE 1, TERMINAL, HAND OR POWER ACTUATED, WIRE TERMINATION, PNEUMATIC TOOL FOR WIRE BARREL SIZES 8 THROUGH 0000		



## DETAIL B: INDENTERS

FIGURE 2 - DIE CAP AND DIE ASSEMBLY (CONTINUED)

TABLE 1 - INDENTER HOUSING AND INDENTER DIMENSIONS

DIE ASSEMBLY PART NUMBER	FOR CONTACT SIZE	DETAIL A		DETAIL B		
		A DIA +.010/-.000	B ±.002	C ±.002	D +.000/-.025	E ±.002
M22520/23-02	8	.500	.050	.170	.055	.055
M22520/23-03	6	.500	.060	.174	.060	.060
M22520/23-04	4	.650	.065	.187	.062	.062
M22520/23-05	0	.690	.094	.198	.070	.070
M22520/23-06	00	.850	.100	.210	.075	.075
M22520/23-07	0000	.875	.130	.250	.090	.090
M22520/23-08	1	.650	.091	.203	.047	.047

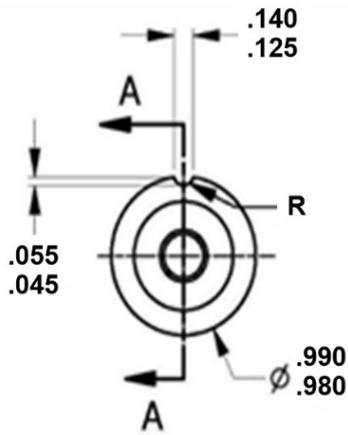


### AEROSPACE STANDARD

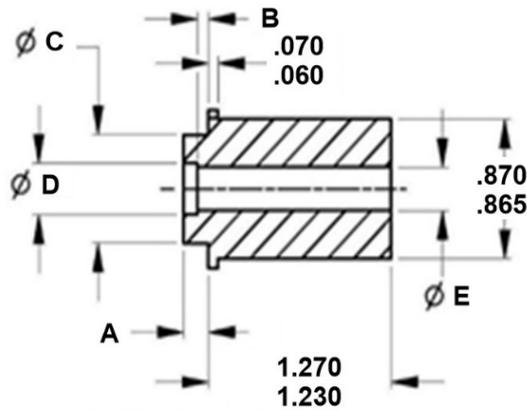
(R) CRIMP TOOLS, TYPE 1, TERMINAL, HAND OR POWER  
ACTUATED, WIRE TERMINATION, PNEUMATIC TOOL  
FOR WIRE BARREL SIZES 8 THROUGH 0000

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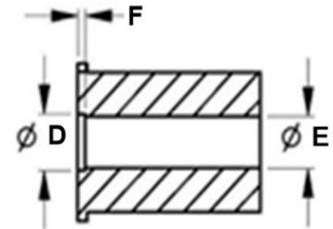
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SECTION A - A  
SCALE 1 : 1



LOCATOR WITH BOSS  
LOCATES CONTACTS  
AS39029/29 & AS39029/30  
AS39029/44 & AS39029/45



LOCATOR WITHOUT BOSS  
LOCATES CONTACTS  
AS39029/48 & AS39029/49

FIGURE 3 - CONTACT LOCATORS (POSITIONERS)

TABLE 2 - LOCATOR DIMENSIONS

LOCATOR PART NUMBER	CONTACT SIZE (MATING END)	A ±.005	B ±.005	Ø "C" ±.005	Ø "D" +.010 -.000	Ø "E" +.010 -.000	F ±.005
M22520/23-09	8	.170	.075	.495	.316	.266	---
M22520/23-10	6	---	---	---	.348	.316	.050
M22520/23-11	4	.170	.065	.495	.423	.343	---
M22520/23-12	4 2/	---	---	---	.423	.338	.050
M22520/23-13	0	.170	.025	.675	.618	.520	---
M22520/23-14	0 1/	---	---	---	.615	.520	.050
M22520/23-15	00	---	---	---	.694	.660	.050
M22520/23-16	0000	---	---	---	.787	.754	.050

1/ CRIMP BARREL END IS CONTACT SIZE 1 FOR CONTACTS M39029/48- 323 AND -324.

2/ MATING END IS FOR CONTACTS M39029/48-320, -321, AND -322 NEUTRAL PIN OR GROUNDING PIN.

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	(R) CRIMP TOOLS, TYPE 1, TERMINAL, HAND OR POWER ACTUATED, WIRE TERMINATION, PNEUMATIC TOOL FOR WIRE BARREL SIZES 8 THROUGH 0000		

REQUIREMENTS: THE COMPLETE REQUIREMENTS FOR PROCURING THE PRODUCT DESCRIBED HEREIN SHALL CONSIST OF THIS DOCUMENT AND THE LATEST ISSUE OF AS22520.

1. CONFIGURATION:

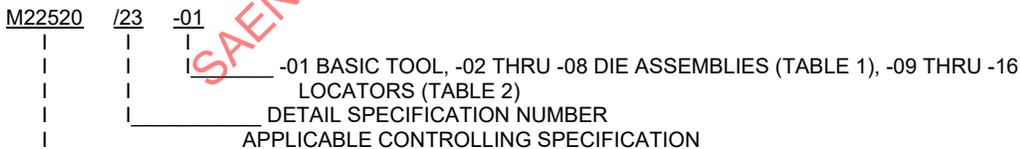
- A. TOOL CONFIGURATION SHALL BE IN ACCORDANCE WITH FIGURES 1 TO 3, AND TABLES 1 AND 2. DIMENSIONS ARE IN INCHES. UNLESS OTHERWISE SPECIFIED, FIGURE 1 TOLERANCE IS  $\pm .125$  INCHES, AND FIGURES 2 AND 3 TOLERANCE IS  $\pm .005$  INCHES.
- B. BREAK ALL SHARP EDGES.
- C. AIR PRESSURE SOURCE REQUIREMENT SHALL BE 100 TO 120 LB/IN<sup>2</sup> (SEE APPLICATION NOTE). AS22520/23 IS DESIGNED TO WITHSTAND AIR PRESSURE UP TO 150 POUNDS. PRESSURE ABOVE 150 POUNDS MAY DAMAGE OR SHORTEN THE LIFE OF THE TOOL.
- D. INDENTER CLOSURE SELECTOR POSITIVE DETENT AT EACH SETTING IS NOT REQUIRED.
- E. THE CENTERLINES OF OPPOSING INDENTERS MUST ALIGN WITHIN .020 INCH.
- F. INDENTER LENGTH IS CONTROLLED BY WIRE SIZE CALLOUTS (SEE TABLE 1).
- G. CRIMP JOINT MAY BE OBTAINED WITH AID OF A DIE ASSEMBLY.
- H. M22520/23-01 BASIC TOOL WEIGHT, LESS DIES AND LOCATORS, SHALL BE 19 POUNDS MAXIMUM.
- I. THE FULL CYCLE MECHANISM SHALL BE TAMPER PROOF SO THAT IT CANNOT BE RELEASED DURING THE NORMAL CRIMPING CYCLE. THE REQUIREMENT SHALL APPLY REGARDLESS OF THE PLANE OR POSITION OF THE TOOL, WITH OR WITHOUT A WIRED ASSEMBLY IN THE TOOL.
- J. THE FULL CYCLE MECHANISM SHALL BE A MECHANICAL OR PNEUMATIC MECHANISM WHICH ADVANCES THE INDENTERS TO CRIMP THE CONTACT. THE MECHANISM SHALL OPERATE IN SUCH A MANNER, THAT IT ENSURES THE INDENTERS ARE COMPLETELY CLOSED FOR A PROPER CRIMP ON THE CONTACT/CONDUCTOR COMBINATION. THE MECHANISM SHALL RELEASE AUTOMATICALLY AFTER THE CRIMP IS COMPLETED RETURNING THE INDENTERS TO THE FULLY OPEN POSITION.

2. MATERIAL AND FINISH:

MATERIAL SHALL BE IN ACCORDANCE WITH AS22520 EXCEPT AS FOLLOWS:

- A. M22520/23-01 BASIC TOOL BODY SHALL BE ALUMINUM 356 IN ACCORDANCE WITH ASTM B26/B26M WITH BLACK FINISH.
- B. DIE CAP AND BOOSTER END CAPS SHALL BE ALUMINUM 6061 IN ACCORDANCE WITH ASTM B221 WITH ANODIZE FINISH OR TREATED TO RESIST CORROSION (COLOR OPTIONAL).
- C. BENCH MOUNT BRACKET SHALL BE COMMERCIAL GRADE STEEL WITH BLACK FINISH.
- D. INDENTER HOUSING SHALL BE 17-4 PH STAINLESS STEEL.
- E. INDENTERS SHALL BE TOOL STEEL, HEAT TREATED TO ROCKWELL C54-56.
- F. LOCATORS SHALL BE ALUMINUM 2024 IN ACCORDANCE WITH ASTM B209.

3. PART IDENTIFICATION NUMBER (PIN) AND MARKING:



- A. MARKING ON THE BASIC TOOL SHOWN IN FIGURE 1 SHALL INCLUDE THE M22520/23-01 PIN, SUPPLIER NAME OR SYMBOL (REFER TO AIR1351) AND PART NUMBER (LOCATION IS OPTIONAL).
- B. MARKING ON THE DIE ASSEMBLY CAP SHOWN IN FIGURE 2 SHALL INCLUDE THE DIE GAGE LIMITS SHOWN IN TABLE 3 AND APPLICABLE CONTACT SIZE SHOWN IN TABLE 1.
- C. MARKING ON THE LOCATOR FACE SHOWN IN FIGURE 3 SHALL INCLUDE THE APPLICABLE PIN SHOWN IN TABLE 2 AND THE APPLICABLE CONTACT SIZE.

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4. INSPECTION GAGES:

INSPECTION GAGES SHALL BE IN ACCORDANCE WITH TABLE 3.

**TABLE 3 - DIE ASSEMBLY INSPECTION GAGE LIMITS**

DIE ASSEMBLY PART NUMBER	CONTACT SIZE (WIRE BARREL)	DIE GAGING LIMITS		AS22520/3 GAGE PIN
		GO	NO GO	
M22520/23-02	8	.130	.136	M22520/3-18
M22520/23-03	6	.171	.178	M22520/3-19
M22520/23-04	4	.195	.202	M22520/3-20
M22520/23-05	0	.325	.332	M22520/3-21
M22520/23-06	00	.351	.358	M22520/3-22
M22520/23-07	0000	.425	.432	M22520/3-23
M22520/23-08	1	.255	.265	M22520/3-24

5. ASSEMBLY AND APPLICATION INSTRUCTION IS REQUIRED FOR EACH BASIC TOOL.

6. PERFORMANCE REQUIREMENT:

TOOL PERFORMANCE SHALL BE IN ACCORDANCE WITH AS22520 AND THE FOLLOWING.

A. VISUAL AND MECHANICAL EXAMINATION: REQUIRED (INCLUDES REQUIREMENT 1, 2, AND 3).

B. INSPECTION GAGING:

INSPECTION GAGING OF THE TOOL AS SPECIFIED IN AS22520 (WITHOUT DIE ASSEMBLY INSTALLED) IS NOT APPLICABLE.

REQUIREMENT: INSPECTION GAGING OF EACH DIE ASSEMBLY SPECIFIED IN TABLE 3 IS REQUIRED. THE "GO" GAGE SHALL PASS FREELY THROUGH THE DIE SET. THE "NO-GO" GAGE MAY ENTER, BUT SHALL NOT PASS THROUGH THE DIE SET.

TEST METHOD: PERFORM THE INSPECTION BY SELECTING EACH AS22520/3 GAGE (OR EQUIVALENT PRECISION GAGE) FOR THE DIE SET FROM TABLE 3, ACTUATE THE TOOL TO THE FULLY CLOSED POSITION BY HOLDING THE TRIGGER BUTTON DOWN AND INSERT THE "GO" AND "NO-GO" GAGE BETWEEN THE INDENTERS. THE GO GAGE SHALL PASS THROUGH THE INDENTERS, BUT THE NO-GO GAGE SHALL NOT PASS THROUGH THE INDENTERS. DO NOT FORCE THE GAGE OR CRIMP ON THE GAGE. DAMAGE TO THE GAGE AND INDENTERS CAN OCCUR.

C. HUMIDITY (STEADY STATE) IS NOT REQUIRED.

D. IN SERVICE GAGING HANDLE, INDENTER, AND DIE RETURN OPERATION (FULL CYCLING) IS NOT REQUIRED.

E. RATCHETING MECHANISM NOT REQUIRED.

FULL CYCLING MECHANISM REQUIRED IN PLACE OF RATCHETING MECHANISM TEST.

REQUIREMENT: THE DIFFERENCE BETWEEN THE FIRST AND THIRD CRIMP MEASUREMENTS SHALL NOT EXCEED .010 INCH.

TEST METHOD: WITH 90 LB/IN<sup>2</sup>. AIR SUPPLIED TO THE TOOL, CRIMP A 0.312 INCH DIAMETER SOFT COPPER ROD WITH A M22520/23-04 DIE ASSEMBLY. MEASURE AND RECORD THE ROD THICKNESS BETWEEN OPPOSING INDENTS. STARTING WITH A LOW AIR PRESSURE THAT WILL NOT ALLOW THE INDENTERS TO OPEN WHEN CRIMPED ON THE ROD, INCREASE THE AIR PRESSURE UNTIL THE TOOL COMPLETES THE CYCLE AND THE INDENTERS OPEN. AT THIS SAME AIR PRESSURE, CRIMP THE ROD A THIRD TIME. MEASURE AND RECORD THE THICKNESS BETWEEN OPPOSING INDENTS.

F. HIGH COMPRESSION FORCE NOT REQUIRED.

G. COMPRESSION FORCE NOT REQUIRED.

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- H. CONTACT DEFORMATION NOT REQUIRED.
- I. CONTACT CRACKING OF THE CRIMP CONNECTION NOT REQUIRED (SEE R3).
- J. CONTACT CONCENTRICITY NOT REQUIRED (SEE R4).
- K. CONTACT CRIMPED VOLTAGE DROP NOT REQUIRED (SEE R5).
- L. CONTACT TENSILE STRENGTH NOT REQUIRED (SEE 6R).
- M. DIELECTRIC STRENGTH NOT REQUIRED.
- N. LOW TEMPERATURE CRIMP NOT REQUIRED.
- O. SHOCK EXPOSURE NOT REQUIRED.
- P. LIFE REQUIRED.

REQUIREMENT: THE TOOL SHALL PERFORM WITHOUT FAILURE FOR 1000 CRIMPS WITH NO ADJUSTMENTS OR REPAIRS, BUT IT SHALL BE PERMISSIBLE TO REMOVE FOREIGN MATTER AND LUBRICATE THE TOOL EVERY 250 CYCLES. AT THE END OF 1000 CRIMPS, THE TOOL SHALL PASS THE INSPECTION GAGE REQUIREMENT THEN BE DISASSEMBLED AND THE INDENTER AND LOCATOR IN FIGURES 1 AND 2 SHALL SHOW NO CRACKING, WEAR, OR DIMENSIONAL CHANGES.

TEST METHOD: ONE M22520/23-01 TOOL WITH AN M22520/23-07 DIE ASSEMBLY SHALL BE TESTED FOR 1000 CRIMPS ON COMMERCIAL LEADED BRONZE TEST RODS WITH A ROCKWELL B HARDNESS OF  $50 \pm 2$  WITH A DIAMETER  $0.750 + .004, - .003$  INCH.

- Q. SALT SPRAY NOT REQUIRED.
- R. TOOL FUNCTIONALITY VERIFICATION REQUIRED.

THE AS22520/23 TOOL AND ACCESSORIES ARE CONFIGURATION CONTROLLED. AS RESULT THE PERFORMANCE OF THE CONTACT/WIRE COMBINATION IS DETERMINED IN THE CONTACT SPECIFICATION FOR THE TOOL THAT IS SPECIFIED IN THE CONTACT SPECIFICATION. THE FOLLOWING TESTS ARE PERFORMED ON A CONTACT/WIRE COMBINATION FOR EACH DIE ASSEMBLY TO DEMONSTRATE THE AS22520/23 TOOL IS PERFORMING AS REQUIRED. THESE RESULTS MAY VARY FROM ONE CONTACT/WIRE COMBINATION TO ANOTHER COMBINATION USING THE SAME CRIMP TOOL. FOR CONTACT/WIRE COMBINATION FAILURES SEE R7.

**TABLE 4 - AS22520/23 TOOL AND AS39029 CONTACT/WIRE COMBINATIONS**

DIE ASSEMBLY PART NUMBER	LOCATOR	CONTACT SIZE (WIRE BARREL)	AS39029 MATING CONTACTS		WIRE 1/ AS22759/84-	CRIMP BARREL MAXIMUM DIAMETER (INCH)
M22520/23-						
02	09	8	M39029/44-291	M39029/45-298	-8	.269
03	10	6	M39029/48-317	M39029/49-329	-6	.344
04	12	4	M39029/48-320	M39029/49-331	-4	.419
05	14	0	M39029/48-323	M39029/49-333	-01	.612
06	15	00	M39029/48-325	M39029/49-334	-02	.692
07	16	0000	M39029/48-327	M39029/49-335	-04	.784
08	14	1	M39029/48-323	M39029/49-333	-1	.612

1/ OR EQUIVALENT AS29606 CONDUCTOR.

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