INCH-POUND

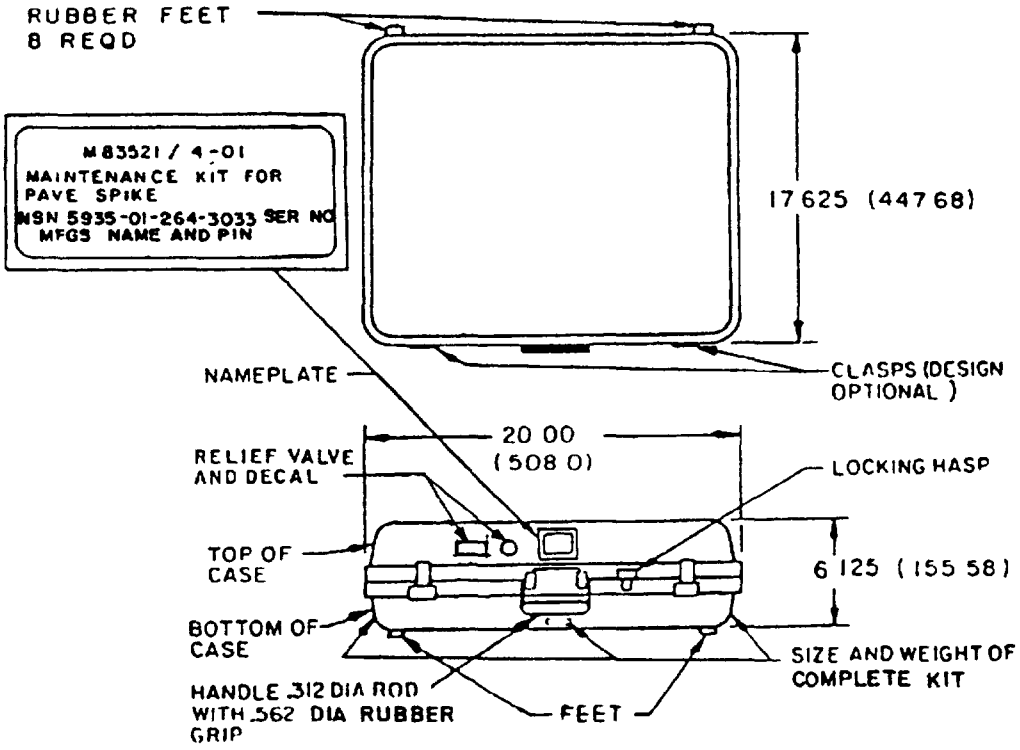
MIL-M-83521/4A(USAF)
29 March 1991
SUPERSEDING
MIL-M-83521/4(USAF)
28 July 1986

MILITARY SPECIFICATION SHEET

MAINTENANCE KIT, ELECTRICAL CONNECTORS, CONTACTS, AND CONNECTOR AND CABLE ACCESSORIES. MAINTENANCE KIT FOR PAVE SPIKE SYSTEM

This specification is approved for use by the Department of the Air Force, and is available for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: MIL-M-83521.



NOTES
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Metric equivalents are in parentheses
4. Part or Identifying Number (PIN) M83521/4-01 includes case and tools.

FIGURE 1. Maintenance kit for pave spike system

DISTRIBUTION STATEMENT A Approved for public release, distribution is unlimited

MAINTENANCE KIT

(1) M83521/4-01 - Tool case assembly plus all tools.

PARTS LIST:

(1) M83521/4-02 - Tool case assembly.
(1) M22520/5-01 - Crimp tool frame.
(1) M22520/4-01 - Crimp tool frame with M22520/4-02 single position head.
(1) M22520/2-01 - Crimp tool frame.
(1) M22520/1-01 - Crimp tool frame.
(1) M22520/21-01 1/ 2/ - Crimp tool.
(1) M22520/22-01 1/ 2/ - Crimp tool.
(1) M22520/31-01 1/ 2/ - Crimp tool with M22520/31-02 single position head.
(1) Ideal wire stripper PIN 45-173 for 10-14 AWG. (FSCM 30119). 1/
(1) Ideal wire stripper PIN 45-174 for 16-26 AWG. (FSCM 30119) 1/
(1) M22520/1-02 - Turret head.
(1) M22520/1-04 - Turret head.
(1) M22520/1-05 - Universal head.
(1) M22520/1-09 - Turret head.
(1) M22520/1-10 - Turret head.
(1) M22520/2-02 - Positioner.
(1) M22520/2-06 - Positioner.
(1) M22520/2-07 - Positioner.
(1) M22520/2-08 - Positioner.
(1) M22520/2-09 - Positioner.
(1) M22520/2-10 - Positioner.
(1) M22520/2-12 - Positioner.
(1) M22520/2-13 - Positioner.
(1) M22520/2-14 - Positioner.
(1) M22520/2-15 - Positioner.
(1) M22520/2-16 - Positioner.
(1) M22520/2-17 - Positioner.
(1) M22520/2-18 - Positioner.
(1) M22520/2-29 - Positioner.
(1) Daniels K30C 1/ - Positioner. Equivalent to Astro Tool 616451 (FSCM 11851 and 58164).
(1) M22520/2-34 1/ 2/ - Positioner.
(1) M22520/22-02 - Positioner.
(1) M22520/22-03 - Positioner.
(1) M22520/21-02 - Positioner.
(1) M22520/21-04 - Positioner.
(1) M22520/5-XX 1/ 2/ - Die set.
(1) M22520/5-XX 1/ 2/ - Die set.
(1) Daniels HX3-8Z 1/ - Die removal tool (FSCM 11851).
(1) Allen 74008 1/ - 9/64 hex wrench (FSCM 70276).
(1) M22520/3-1 - In-service inspection gauge.
(1) M81969/17-03 1/ 2/ - Installing tool
(1) M81969/19-07 1/ 2/ - Removal tool.
(1) M81969/8-09 1/ 2/ - Installing tool.
(1) M81969/8-07 1/ 2/ - Installing tool.
(1) M81969/8-05 1/ 2/ - Installing tool.
(1) M81969/8-03 1/ 2/ - Installing tool.
(1) M81969/8-01 1/ 2/ - Installing tool.

FIGURE 1. Maintenance kit for pave spike system - Continued.

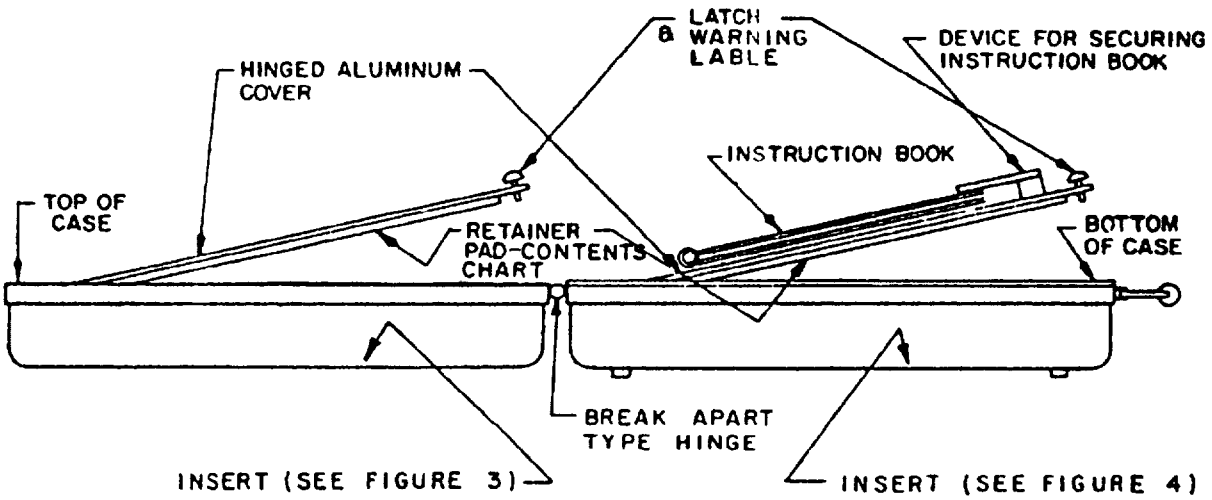
PARTS LIST (continued)

(1)	M81969/8-10 1/ 2/	-	Removal tool.
(1)	M81969/8-08 1/ 2/	-	Removal tool.
(1)	M81969/8-06 1/ 2/	-	Removal tool.
(1)	M81969/8-04 1/ 2/	-	Removal tool.
(1)	M81969/8-02 1/ 2/	-	Removal tool.
(5)	M81969/14-04	-	Installing/removal tool.
(5)	M81969/14-03	-	Installing/removal tool.
(5)	M81969/14-02	-	Installing/removal tool.
(5)	M81969/16-03 1/ 2/	-	Installing/removal tool.
(5)	M81969/16-02 1/ 2/	-	Installing/removal tool.
(5)	M81969/16-01 1/ 2/	-	Installing/removal tool.
(5)	M81969/16-04 1/ 2/	-	Installing/removal tool.
(2)	M81969/30-20 1/ 2/	-	Removal tool handle.
(1)	M81969/30-21 1/ 2/	-	Removal tool tip.
(1)	M81969/30-22 1/ 2/	-	Removal tool tip.
(1)	M81969/30-23 1/ 2/	-	Removal tool tip.
(1)	M81969/30-24 1/ 2/	-	Removal tool tip.
(1)	M81969/30-25 1/ 2/	-	Removal tool tip.
(1)	M81969/30-26 1/ 2/	-	Removal tool tip.
(1)	M81969/30-27 1/ 2/	-	Removal tool tip.
(1)	Ideal 45-123 1/	-	Wire cutter (FSCM 30119).
(5)	M81969/39-01 1/ 2/	-	Installing/removal tool.
(1)	Daniels DAK51-8 1/	-	Installing tool. Equivalent to Astro Tool A10026 (FSCM 11851 and 58164).
(1)	Daniels DRK51-8 1/	-	Removal tool. Equivalent to Astro Tool ATD2150 (FSCM 11851 and 58164).
(1)	Cannon CET-C6B 1/	-	Removal tool. Equivalent to Astro Tool ATC2188 (FSCM 71468 and 58164).
(1)	Daniels DRK105 1/	-	Tool handle (FSCM 11851).
(1)	Daniels DRK110 1/	-	Tool handle (FSCM 11851).
(1)	Daniels DRK105-22M 1/	-	Removal tool. Equivalent to Astro Tool ATX2005 (FSCM 11851 and 58164).
(1)	Daniels DRK105-22 1/	-	Removal tool. Equivalent to Astro Tool ATX2004 (FSCM 11851 and 58164).
(1)	Daniels DRK105-20 1/	-	Removal tool. Equivalent to Astro Tool ATX2003 (FSCM 11851 and 58164).
(1)	Daniels DRK105-16 1/	-	Removal tool. Equivalent to Astro Tool ATX2002 (FSCM 11851 and 58164).
(1)	Daniels DRK105-12 1/	-	Removal tool. Equivalent to Astro tool ATX2001 (FSCM 11851 and 58164).
(1)	Listo Corp 1620 1/	-	Marking pencil (FSCM 83745)
(1 Set)	Contents charts, instruction sheets and tool selection charts.		

NOTES. 1/ Approved equivalent parts may be used in lieu of specified parts but must be approved in advance by the 2750 ABW-ESP Gentile AFS, Ohio 45444, telephone number 513-296-5534 or autovon 986-5534.

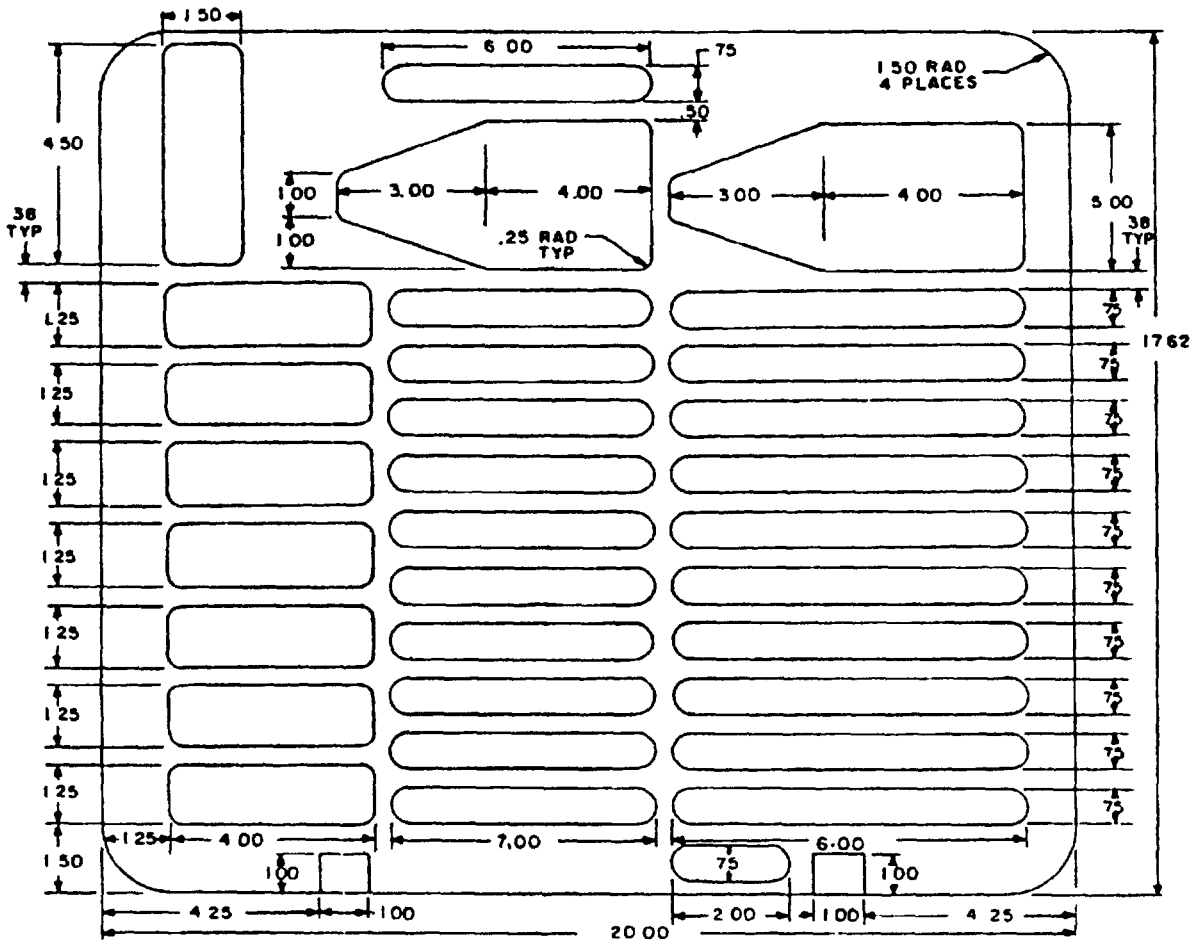
2/ Equivalent parts shall not be used if a military part is available.

FIGURE 1. Maintenance kit for pave spike system - Continued.



NOTES:
1. Remove all burrs, break sharp edges and corners.
2. PIN M83521/4-02 for case only (tools not included).

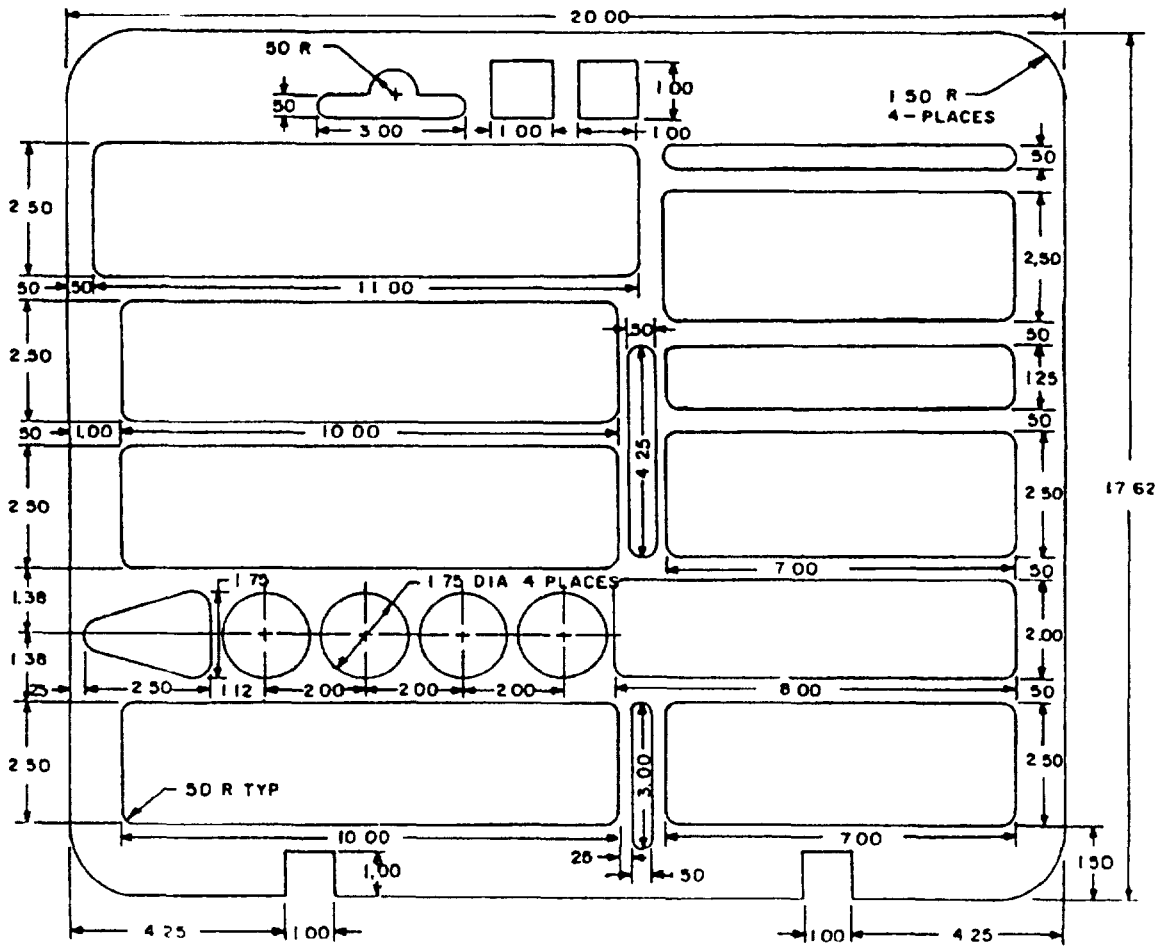
FIGURE 2. Tool case assembly.



Inches	mm	Inches	mm
.25	6.3	3.00	76.2
.38	9.6	4.00	101.6
.50	12.7	4.25	107.9
.75	19.0	4.50	114.3
1.00	25.4	5.00	127.0
1.25	31.8	6.00	152.4
1.50	38.1	7.00	177.8
2.00	50.8	17.62	447.7
		20.00	508.0

NOTES.
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ±.125 (3.18 mm).
4. This insert is part of the tool case assembly (see figure 2).

FIGURE 3. Insert (top of case).



Inches	mm	Inches	mm	Inches	mm	Inches	mm
312	7.92	1.00	25.4	3.00	76.2	6 125	155.58
.375	9.52	1.25	31.8	3.50	88.9	7.00	177 8
.50	12.7	1.50	38.1	4.00	101.6	10.00	254.0
.562	14.27	1.75	44.4	4.50	114.3	11.00	279.4
.625	15.88	2.00	50.8	5.00	127.0	17.625	447 68
.75	19.0	2.50	63.5	6.00	152.4	20.00	508.0

NOTES
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ±.125 (3.18 mm).
4. Remove all burrs, break sharp edges and corners.
5. This insert is part of the tool case assembly (see figure 2).

FIGURE 4. Insert (bottom of case)

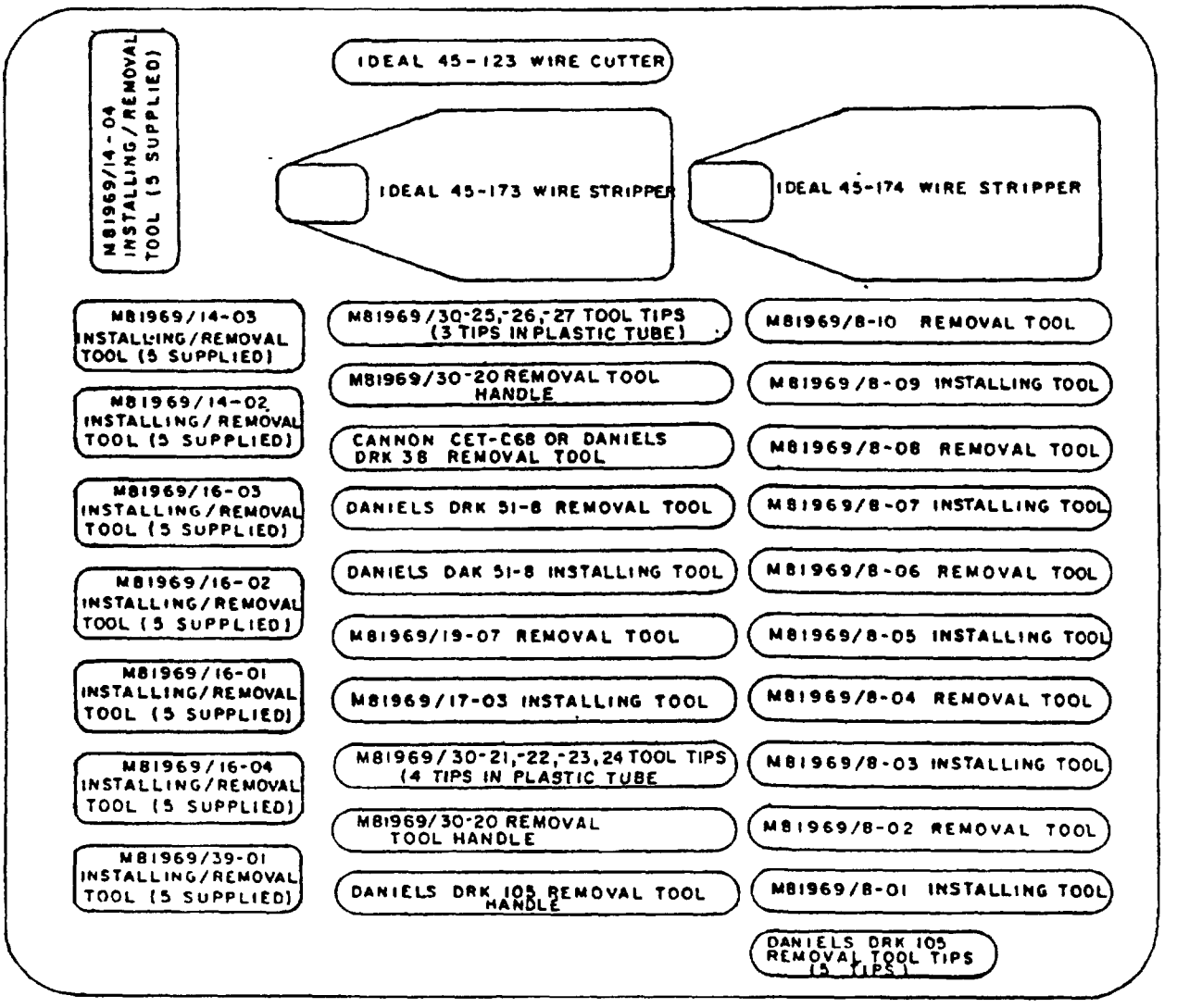


FIGURE 5. Contents chart (top).

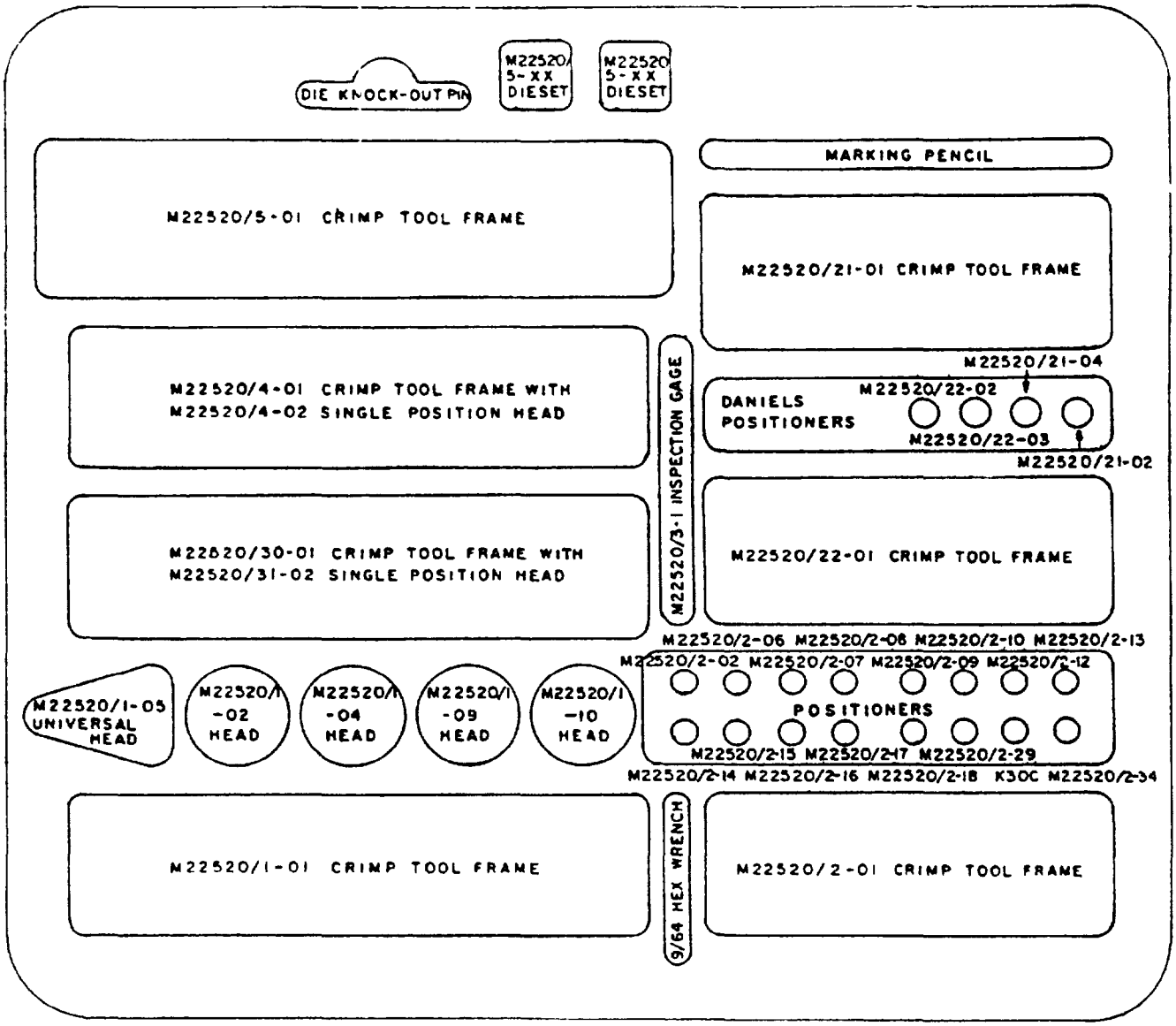


FIGURE 6. Contents chart (bottom).

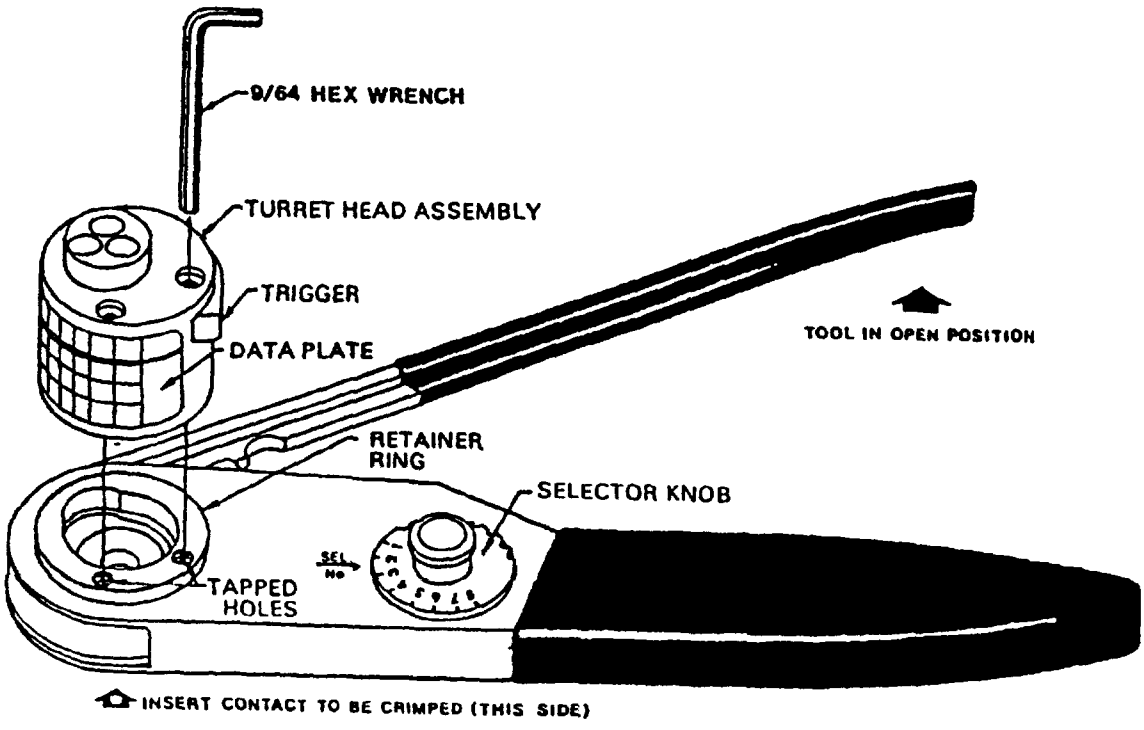
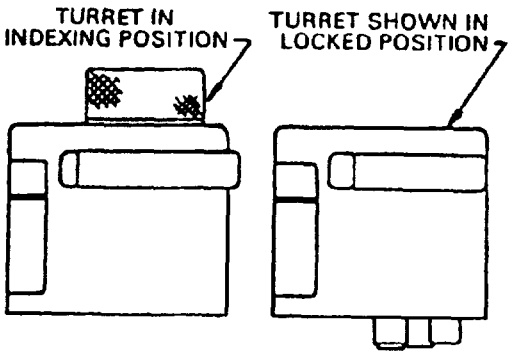
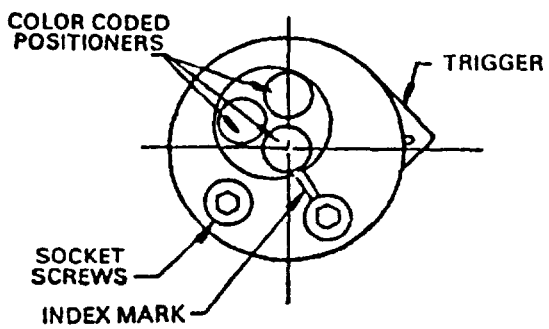


FIGURE 7. M225201/1-01 crimping tool.



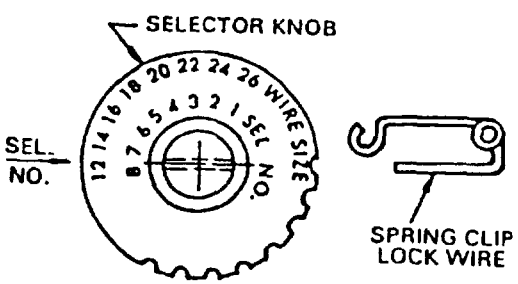
Instructions for changing turret head.

1. Press trigger with releases turret to indexing position.
2. Place selected turret head assembly onto retainer ring with screws line up with tapped holes.
3. After turret head assembly is seated against ring, tighten socket head screws with 9/64 inch Allen wrench. Turret should index easily without binding.
4. To remove, loosen socket head screws until threads are disengaged from retainer ring and remove with a straight lifting motion.
5. All heads (single position, universal and turret) are attached by means of two socket head screws.



Instructions for indexing turret head assemblies.

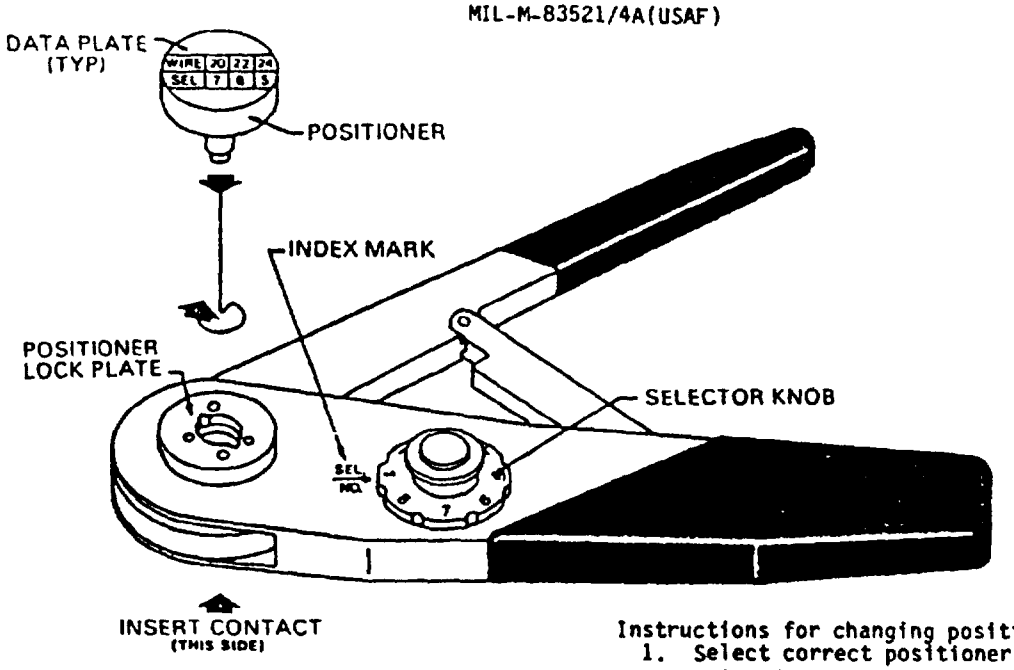
1. Press trigger with releases turret to indexing position.
2. Select positioner desired from color coded data plate on side of turret head assembly.
3. Index turret until color coded positioner is lined up with index mark on top of turret head assembly, at which time the trigger will position the turret.
4. Press turret until it snaps into locked position.



Instructions for using indentor closure selector.

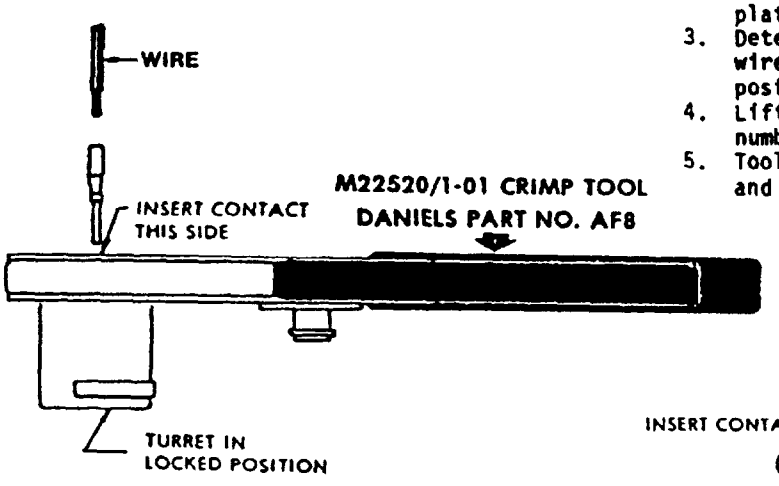
1. Refer to data plate on turret head assembly. Below the wire size and opposite the contact size is listed the correct indentor closure number.
2. Remove the spring clip lock from selector knob.
3. Tool must be in open position when using selector.
4. Raise selector knob and rotate to desired selector number.
5. Replace the spring clip and tool is ready for use.
6. Repeat instruction procedures when changing contact or wire sizes.

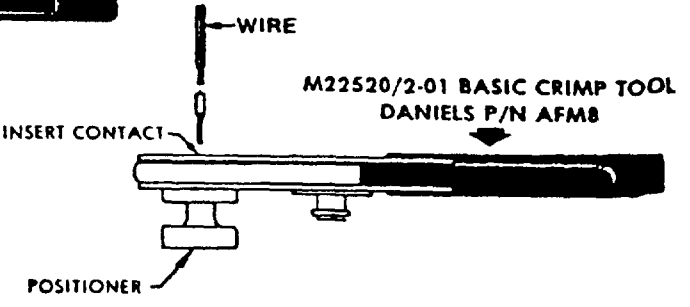
FIGURE 7. M22520/1-01 crimping tool - Continued.



Instructions for changing positioners.

1. Select correct positioner for contact being crimped.
2. Insert positioner into positioner lock plate. Push and rotate 90° to install.
3. Determine correct selector setting for the wire size from the data plate on end of positioner.
4. Lift selector knob and rotate until selector number aligns with index mark.
5. Tool is now ready for use. Insert contact and complete crimping cycle.





Crimping instruction.

1. Insert contact thru indentor opening into positioner.
2. Insert wire into contact and hold securely to insure that it bottoms in contact. Close handles until tool bottoms and ratchet kicks off. Release handles and remove crimped contact.

NOTE: After crimping cycle is completed, inspect contact Make sure the wire is visible thru inspection hole in contact and there are no fractures in contact.

FIGURE 8. M22520/2-01 crimping tool instructions

Contact gauges are used to determine the size of the contact's mating and so that the correct removal tool can be selected. The gauge size that mates closely with the contact is question indicates the contact's size.

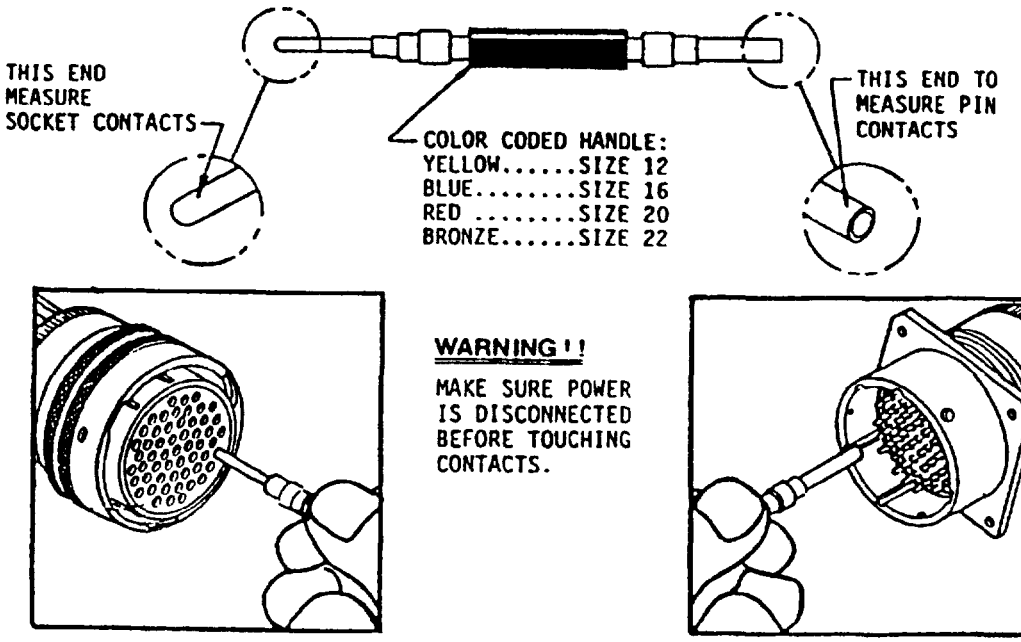
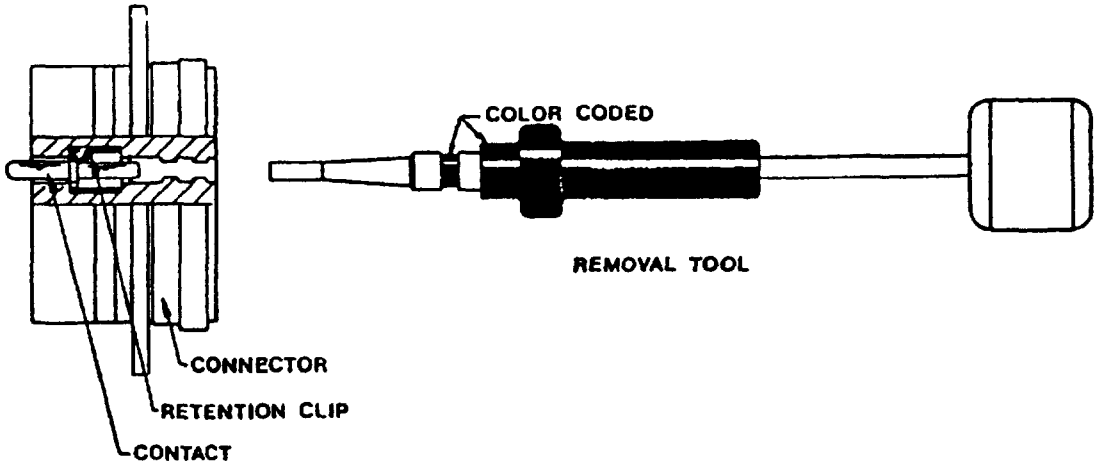
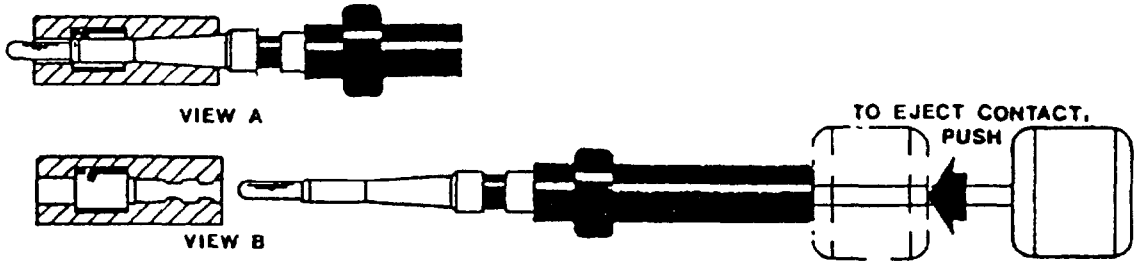


FIGURE 9. Contact gauge.

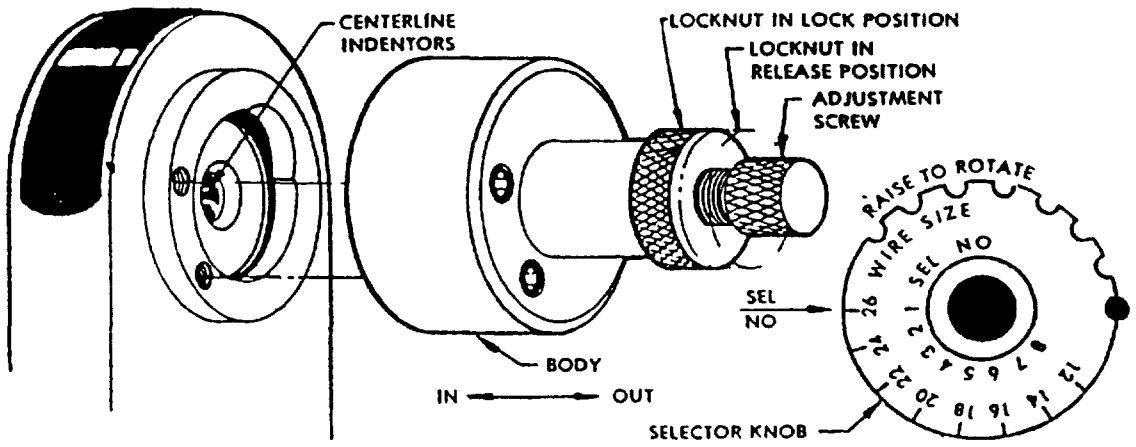


NOTES:
1. Select correct removal tool (see table I).
2. Slide tool into the connector thru the sealing grommet and into the hard dielectric until tool stops against contact shoulder (see view A).
3. At this stage of removal, tool will collapse contact retention clips to the point where they no longer retain control.
4. Grip tool and withdraw contact from connector (see view B).



CAUTION: DO NOT TIP, SPREAD OR ROTATE TOOL WHILE IN CONNECTOR!!

FIGURE 10 Removal tools (rear release connectors).



Introduction

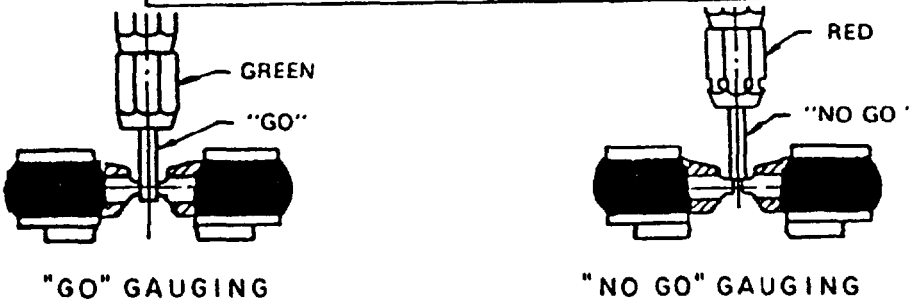
M225210/1-05 universal head assembly is used with M22520/1-01 crimping tool to locate contacts horizontally and vertically between indentors (other than MS contacts).

Procedure:

1. Attach universal head assembly to M22520/1-01 basic crimping tool by means of socket head screws.
2. Raise and rotate selector knob until arrow is in line with wire size to be crimped in contact, wire size settings based on use of MIL-W-16878 silver plated stranded wire crimped in M39029 military contact wire barrel. User must establish his own settings on other contact/wire combinations.
3. With lock nut in release position, turn adjustment screw in until it stops. Insert contact thru indentor opening into positioner and adjust screw out until identors are centered between inspection hole and barrel end of contact. When contact contains insulation cup, center between inspection hole and bottom of insulation cup.
4. Tighten lock nut to body and tool is ready for crimping operation.
5. Insert wire into contact and hold securely to insure that it bottoms in contact. Close handles until too bottoms and ratchet kicks off Release handles and remove crimped contact.

FIGURE 11. M22520/1-05 universal position head.

CRIMPING TOOL P/N	SELECTOR SETTING FOR INSPECTION
M22520/1-01 (AF8)	4
M22520/2-01 (AFM8)	8

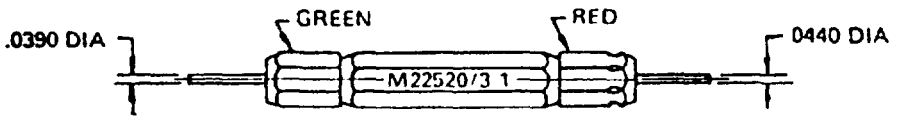


"GO" GAUGING

"NO GO" GAUGING

Close handles to fully closed position. Insert GO gauge as shown. Gauge must pass freely between indentor tips.

Close handles to fully closed position. Insert NO-GO gauge as shown. Gauge must not enter between indentor tips.



CAUTION. DO NOT CRIMP GAUGE

FIGURE 12. M22520/3-1 inspection gauge.

Caution Before attempting to remove dies from tool, assure that all lock pins* have been removed Failure to do so may result in serious damage to the tool.

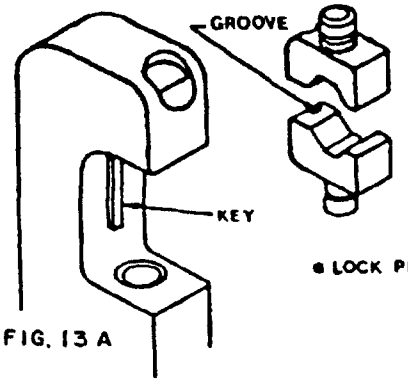


FIG. 13 A

Die installation

Align groove in die with key in crimping tool and push shank of die into hole. (See figure A.) Close handle to make sure dies are properly seated and locked in place. The tool is now ready for use.

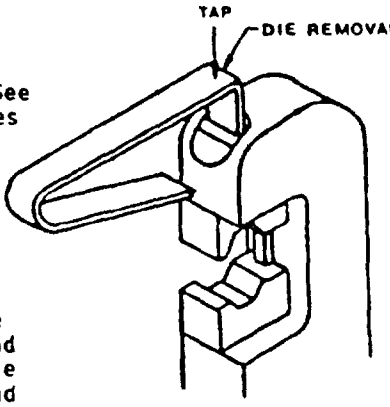


FIG 13B

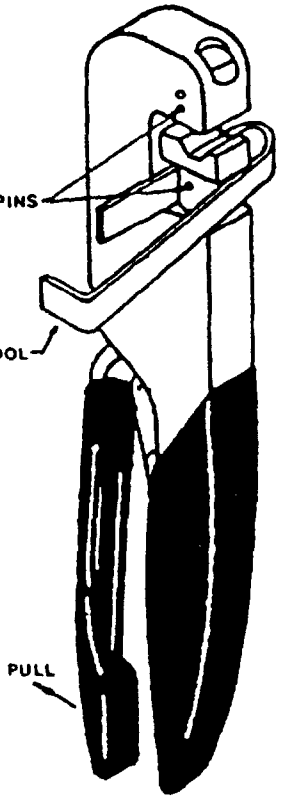


FIG 13C

Die removal

1 With crimping tool handle open place die removal tool against end of knock-out pad and tap gently. (See figure B.) The die will be released from the lock spring and ejected approximately 1/16 inch. It can now be removed by hand.

2. Close the crimping tool handle and slide the die removal tool between the die and tool body. (See figure C.) Pull handle open with a snap action. The die will be released from the lock spring and can then be removed by hand.

NOTE: Die removal tool PIN HX3-82 furnished with crimping tool. (If die removal tool is not available, a rod, 3/16" x 1 3/4" approximately, may be used.)

FIGURE 13 M22520/5-01 and /10-01 crimp tools

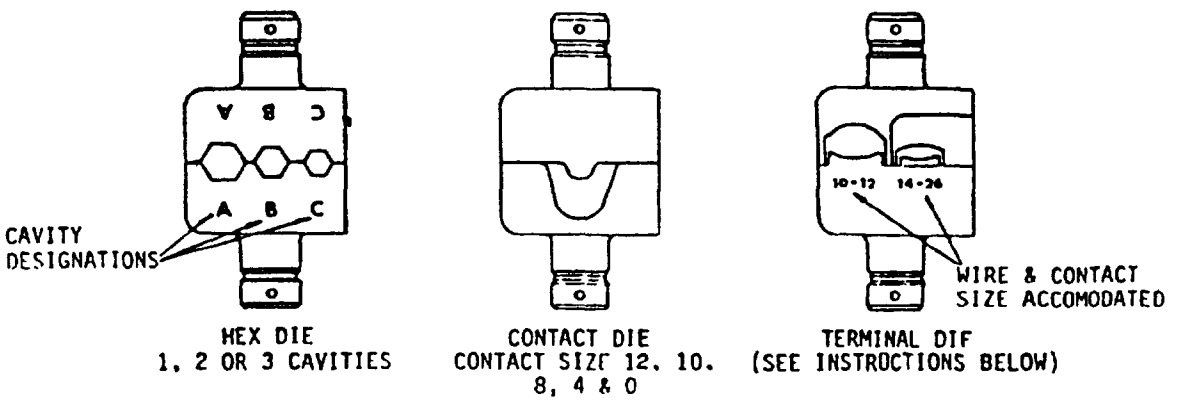
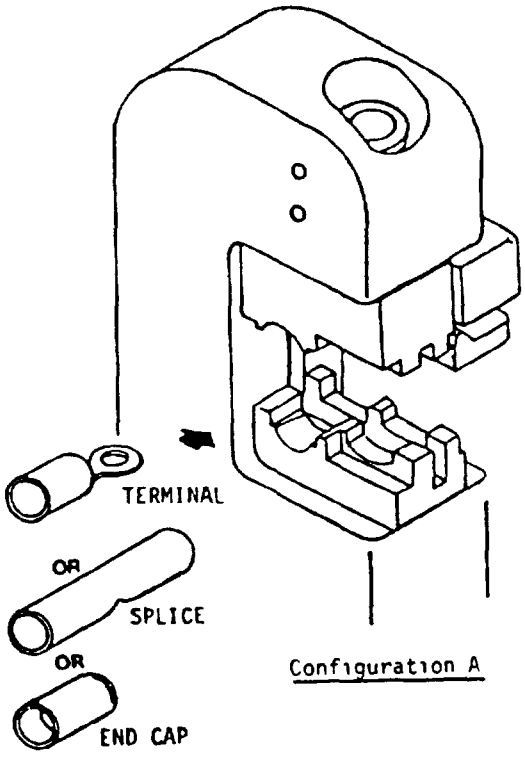


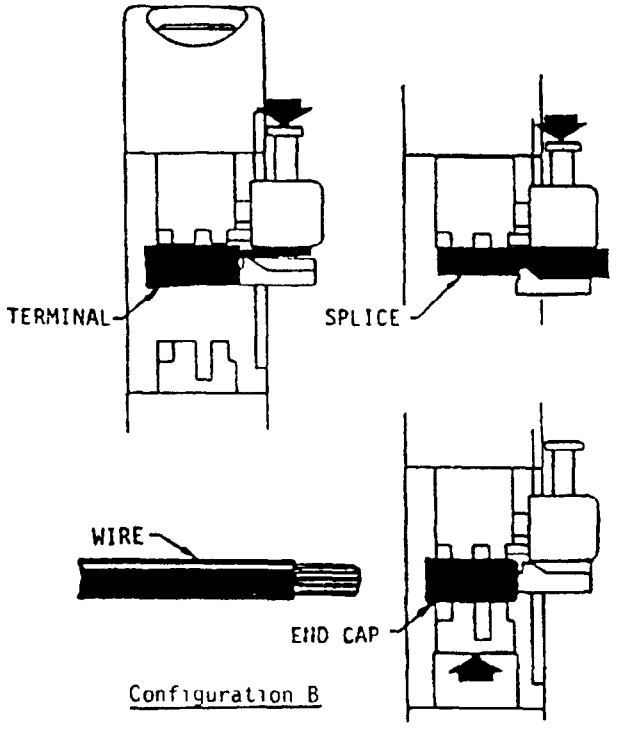
FIGURE 14. M22520/10 and M22520/5 die sets.



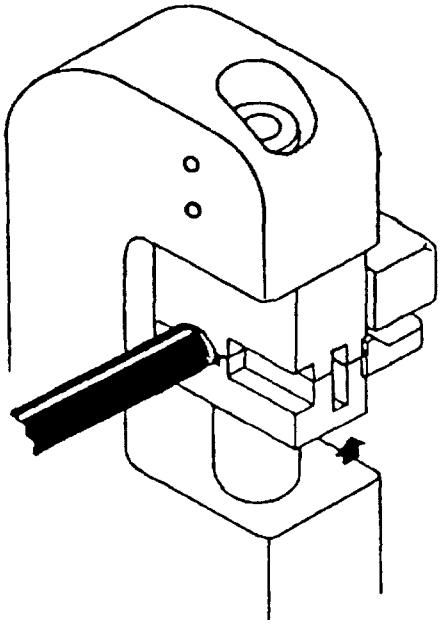
Configuration A

Crimping instructions.

1. With dies open (configuration A) place terminal, splice or end cap in proper cavity. Sizes are stamped below each cavity on side of die.
2. Locate terminal, splice or end cap with locator (configuration B). Terminal should locate with tongue between the arms of the locator. Splice is centered with notch in splice resting on the locator. End caps locate against the face of the locator. Insert wire to proper depth.
3. Close handle of tool until dies are closed and ratchet releases. The crimp is not complete (configuration C).



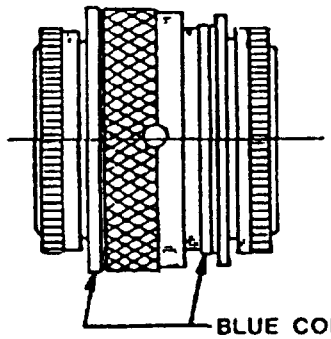
Configuration B



Configuration C

FIGURE 15. Crimping instructions.

MATED PLUG AND RECEPTACLE



NOTE: Connectors having contacts which are installed and removed from the rear of the connector have blue color bands around them.

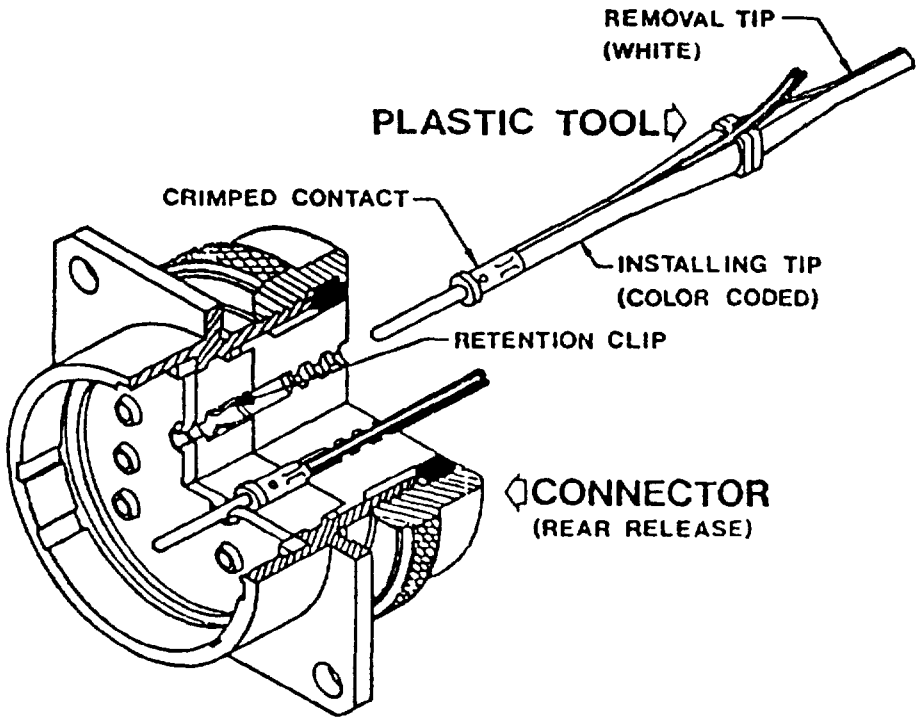
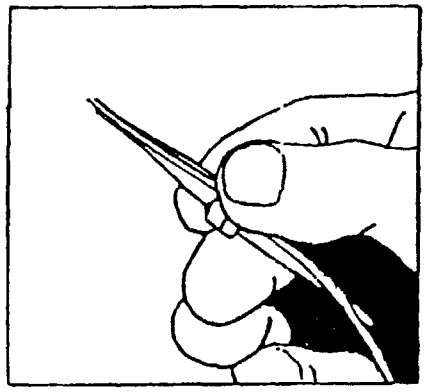
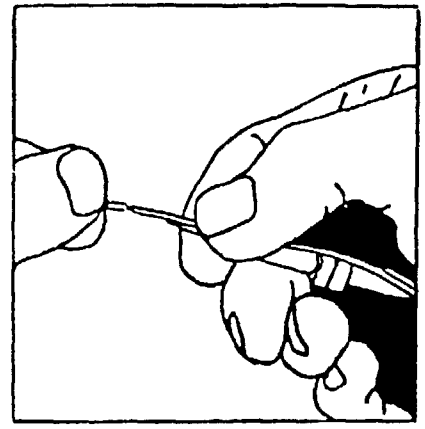


FIGURE 16. Rear release connectors.

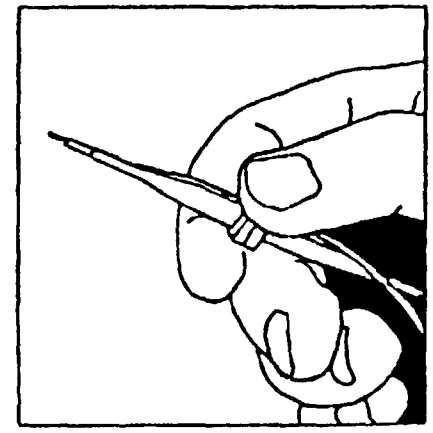
Installing (Colored end)



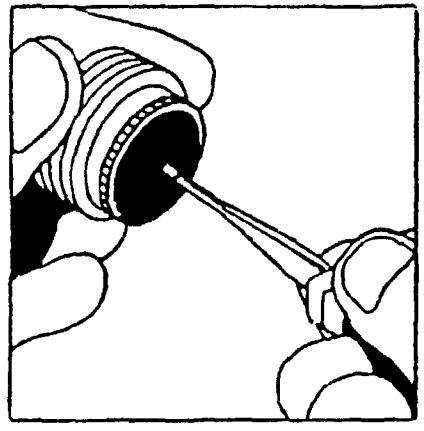
A Hold the insertion half of tool (colored) between the thumb and forefinger and lay the wire to be inserted along the slot, leaving about 1/2" protruding from the end of the tool to the crimp barrel of the contact.



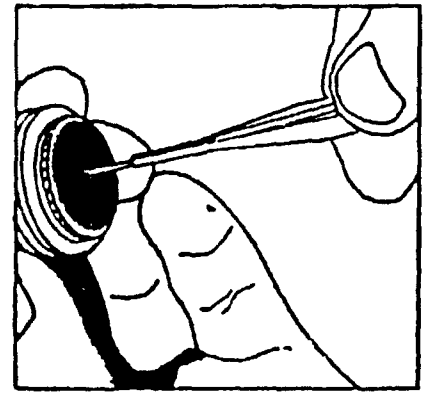
B. Squeeze the wire hard into the tool at the tip, between the thumb and forefinger, and at the same time quickly pull the protruding wire with the other hand away from the tool.



C. The wire will now have snapped into place. Pull it back through tool until the tip seats on the back end of the crimp barrel.



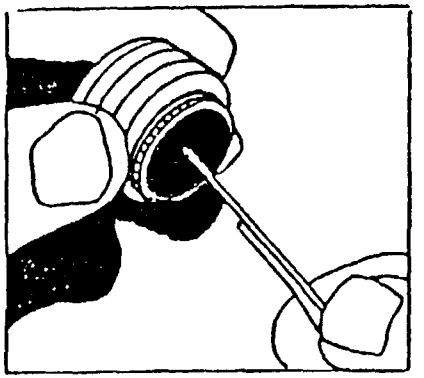
D. Holding the connector with the rear seal facing you slowly push the contact straight into the connector seal.



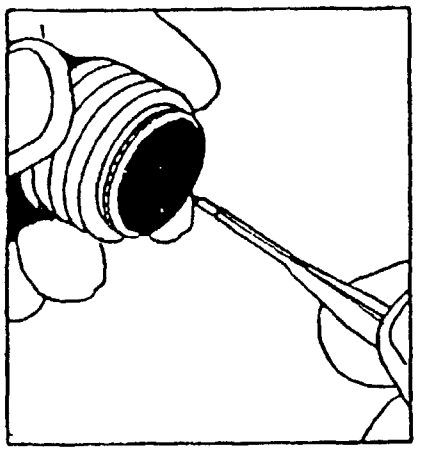
E. A firm stop will be evident when the contact positively seats in the connector. To verify contact retention, pull on the wire with the thumb and forefinger (no gloves allowed).

FIGURE 17. Plastic tools instructions.

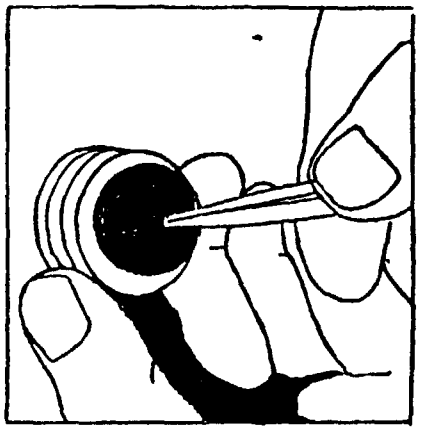
Removal (White end)



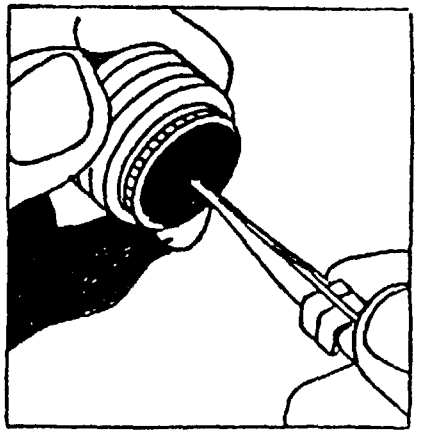
A. With the rear of connector facing you, lay the wire of contact to be removed along the slot of removal half (white) of the tool, leaving about 1/2" from the end of the tool to the rear of the connector.



D. Press the wire of the contact to be removed against the serrations of the plastic tool and pull both the tool and the contact-wire assembly out of the connector.



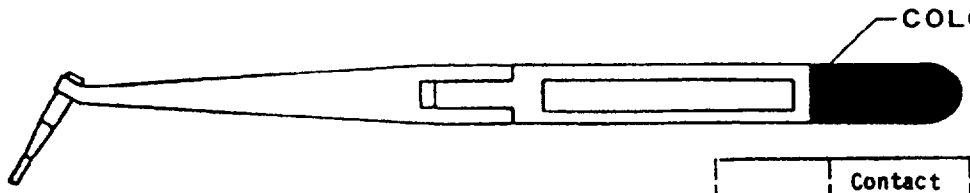
B. Squeeze the wire hard into the tool between the thumb and forefinger abour 1/4" from the tip and at the same time quickly pull the connector away from the tool with the other hand.



C. The wire will now have snapped into place. Slide the tool down over the wire and into the rear seal and push it slowly into the connector until a positive resistance is felt. At this time, the contact retaining clip is in the unlock position.

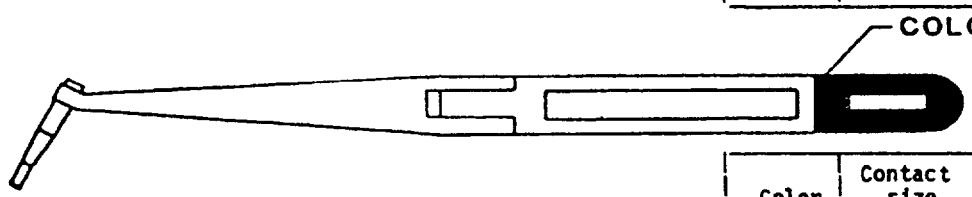
Caution: Do not tip, spread or rotate tool while in connector.

FIGURE 17. Plastic tools instructions - Continued.



Installing Tool:

Color	Contact size	PIN
Yellow	12	M81969/8-09
Blue	16	M81969/8-07
Red	20	M81969/8-05
Brown	22	M81969/8-03
Black	22D, 22M	M81969/8-01



Removal Tool:

Color	Contact size	PIN
Yellow	12	M81969/8-10
Blue	16	M81969/8-08
Red	20	M81969/8-06
Brown	22	M81969/8-04
Black	22D, 22M	M81969/8-02

To install contacts:

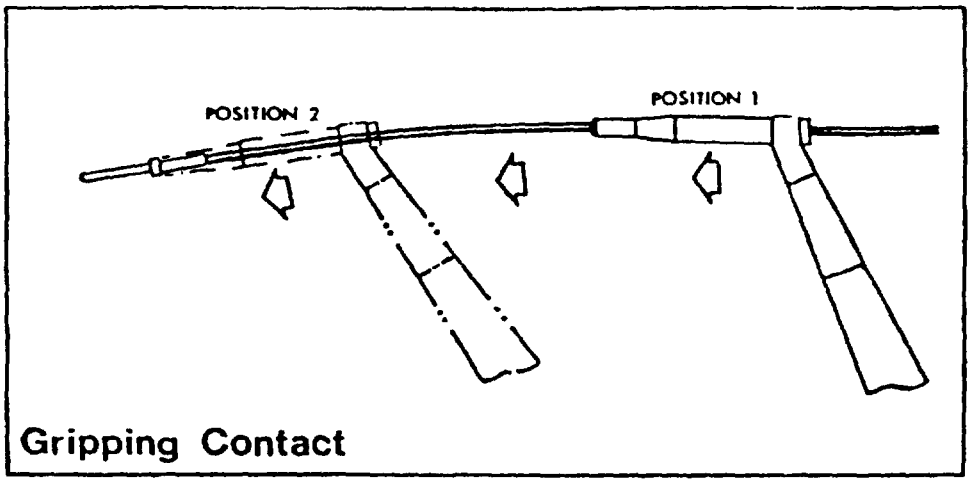
1. Open the tool tips by squeezing the handles and slip the tips around the wire insulation (configuration A, position 1). Slide tool along the wire until tip ends butt against the shoulder on the contact (configuration A, position 2).
2. Carefully push the contact forward and directly in line with the grommet hole until contact is felt to snap into position (configuration B).
3. Slide the tool back along the wire insulation until it clears the grommet and remove tool from wire.
4. To verify contact retention, pull on the wire with the thumb and the forefinger (no gloves allowed).

To remove contacts:

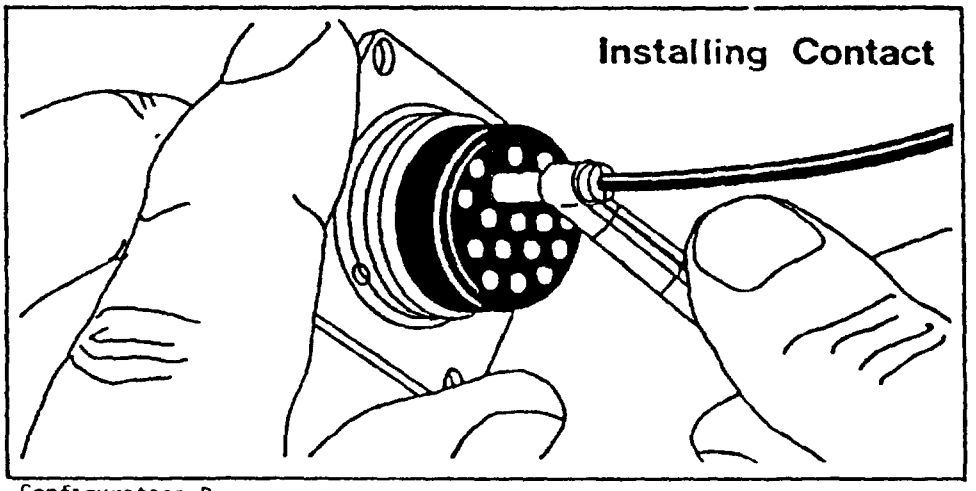
1. Open the tool tips sufficiently to be placed around the wire insulation. Slide the tool down the wire until tool tips enter the grommet and come to a positive stop (configuration B). A slight increase in resistance will be noticed just before the tips bottom. This will spread the retention clip and release its hold on the contact.
2. Holding the tool tip firmly against the positive stop on the contact, grip the wire and simultaneously remove the tool, contact and wire.

Caution. The tips on installing and removal tools used on small contact (i.e. M81969/8-01 and M81969/8-02) have very thin wall sections. This causes them to have sharp edges which can cut the wire insulation or connector sealing grommet. Do not squeeze, spread, tip or rotate the tweezer while entering the connection grommet.

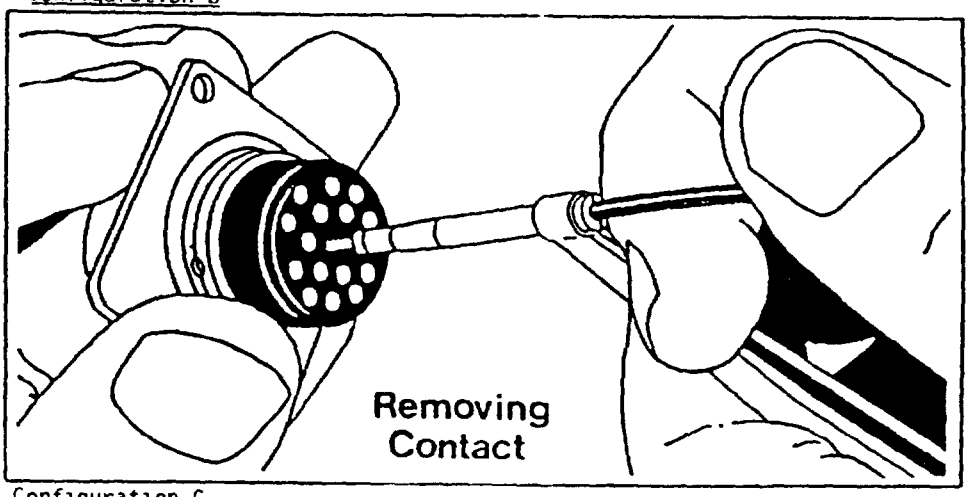
FIGURE 18. Tweezer type installing and removal tools for rear release connectors.



Configuration A



Configuration B



Configuration C

FIGURE 18. Tweezer type installing and removal tools for rear release connectors - Continued.

Front Release Connectors

Operating Instructions - Installing Tools

1. Select correct installing tool and place contact wire assembly in tool.
   (a) #20 contacts with insulation cups are installed by sliding cup into front end of installing tip until end of cup butts against shoulder in installing tip.
   (b) Contacts without insulation cups are installed by sliding wire barrel into front end of installing tip until contact shoulder butts against installing tip.
2. Align tool and contact axially with grommet hole and carefully guide contact through grommet into lock position.

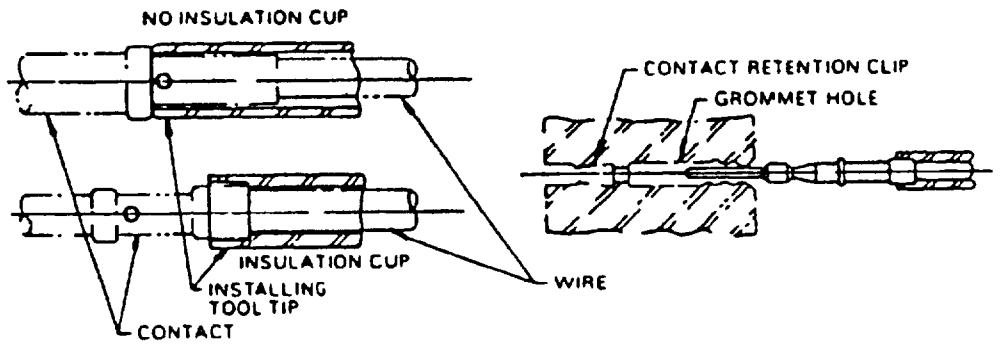
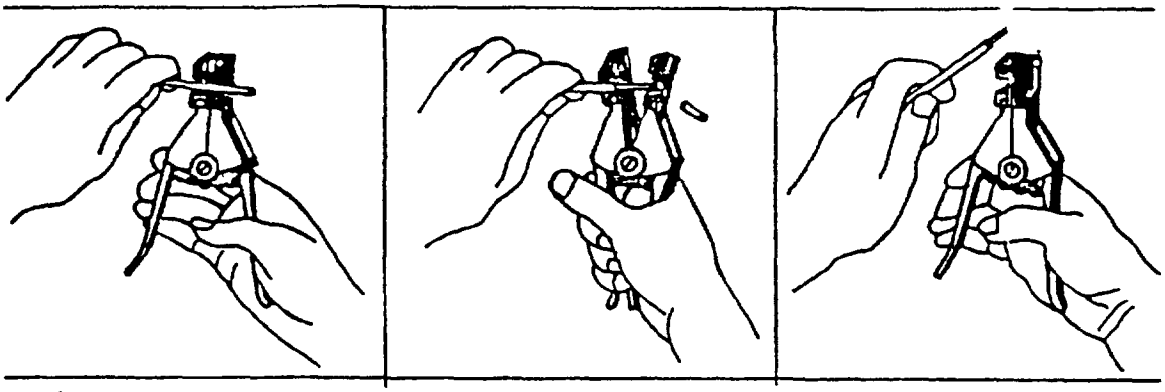


FIGURE 19. Instructions (front release connectors).

The wire strippers are not adjustable. If, after extended use, they do not perform satisfactorily, the blades must be replaced. The replacement blade PIN is etched on the blade, i.e. L-5562, 45-1608-1, etc.



Step A: Select correct hole to match wire gauge.

Step B: Blades remain open until wire is removed. Be careful not to nick or cut

Step C: Stripping is completed.

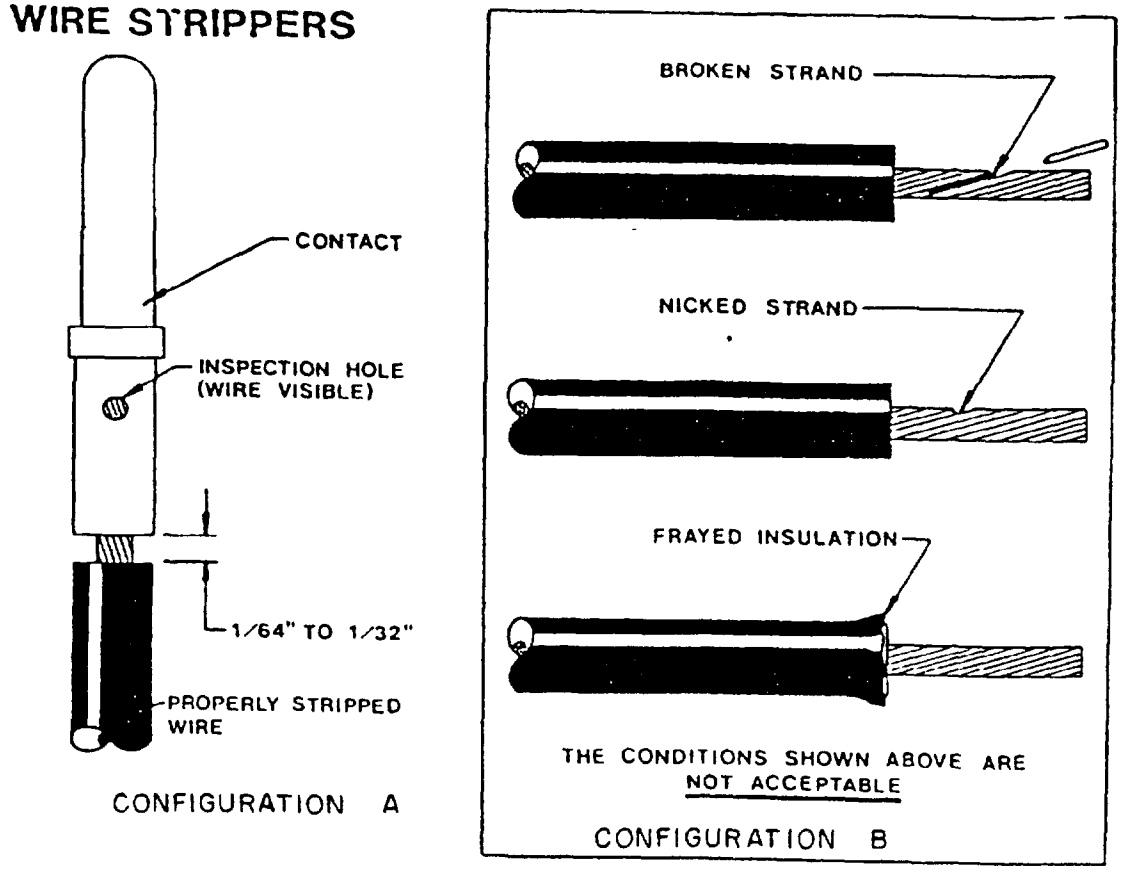
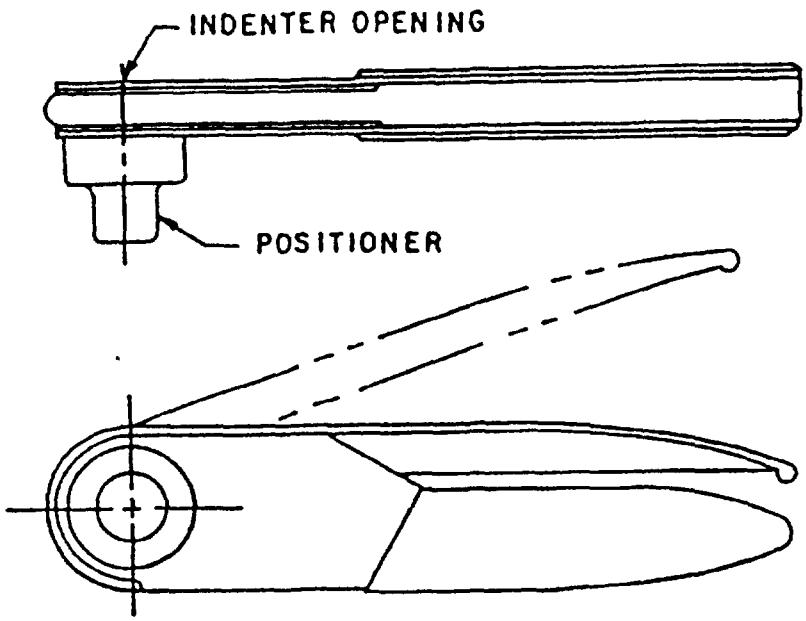


FIGURE 20. Wire stripper instructions

NOTES:
1. Determine the proper length of insulation to be removed. Wire must be visible in inspection hole, insulation must be 1/64" - 1/32" from end of contact or inside of insulation cup (see configuration A).
2. Insert wire into exact center of correct cutting slot for wire size to be stripped. Each slot is marked with wire size.
3. Close handles together as close as possible.
4. Release handles, allowing wire holder to return to open position.
5. Remove stripped wire.
6. After stripping, strands or wire should be twisted firmly together in the same direction as the normal lay of the wire.
7. Stripped wire with nicked or cut strands is not acceptable (see configuration B).

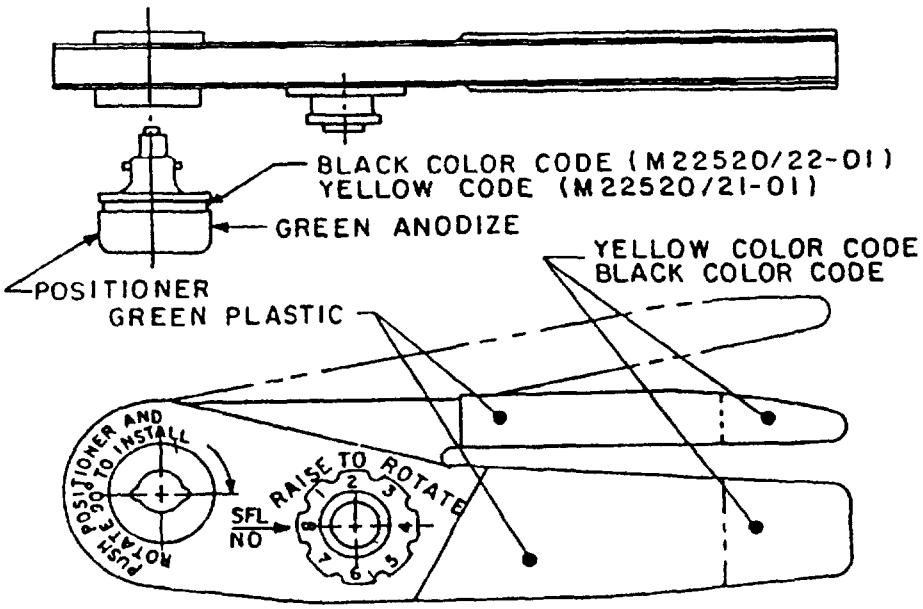
FIGURE 20. Wire stripper instructions - Continued.



NOTE: These tools have present die closures. Both produce a circular crimp for use on outer ferrules of shielded contacts. No adjustments or head changes are required. Refer to the detailed instructions supplied with the contacts for cable preparation and contact assembly.

Tool PIN	Gauging limits	
	GO diameter	NO GO diameter
M22520/4-01	.096	.100
M22520/31-01 M22520/30-02	.142	.146

FIGURE 21. Crimping tool single positioner.

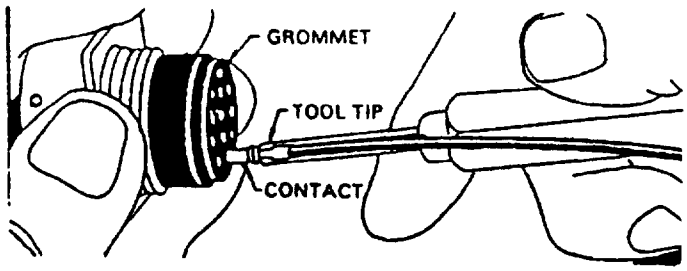


NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. These tools are for use on inner crimp sleeves and outer contacts of size 12 shielded contacts in MIL-C-81511 (series 3 and 4) connectors. Refer to the detailed instructions supplied with the contacts and the appropriate specification sheet (MIL-C-39029/19, /20, or /21) for cable preparation, contact assembly, and crimp tool settings

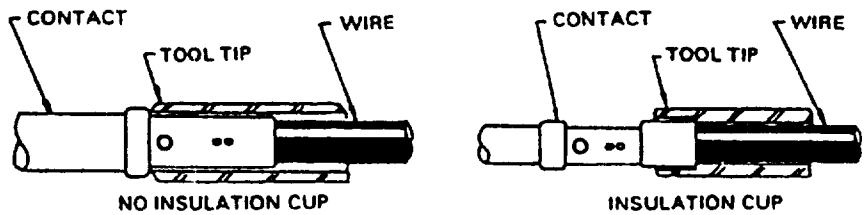
Inches	mm
.064	1.63
.067	1.70
.121	3.07
.124	3.15
.148	3.76
.151	3.84

Tool PIN	Gauge limits			
	Indenters		Retainers	
	GO diameter	NO GO diameter	GO diameter	NO GO diameter
M22520/21-01	.064	.067	.148	.151
M22520/22-01	.064	.067	.121	.124

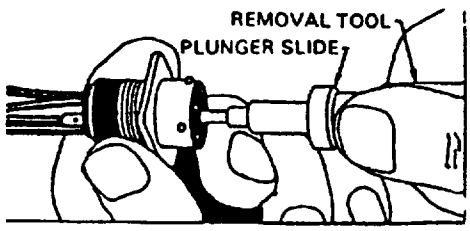
FIGURE 22. Crimping tool.



Configuration A



Configuration B



Configuration C

Operating instructions - installing tools

1. Select correct insertion and place contact/wire assembly in tool.
   (a) #20 contacts with insulation cups are inserted by sliding cup into front end of insertion tip until end of cup butts against shoulder in insertion tip (see configuration B).
   (b) Contacts without insulation cups are inserted by sliding wire barrel into front end of insertion tip until contact shoulder butts against insertion tip (see configuration B).
2. Align tool and contact axially with grommet hole and carefully guide contact through grommet into lock position (see configuration A).

Operating instructions - removal tools

1. Select correct contact removal tool.
2. Tool must be held in straight line; parallel to contact and square to connector face.
3. For pin contacts, insert removal tool tip into connector. Push plunger slide forward to eject contact.

NOTE: Plunger slide must remain in retracted position as removal too tip is inserted into connector.

FIGURE 23. Installing and removal tools.

TABLE I. Tool selection charts

Vendor (vendor code) connector series and type	Basic connector PIN	Conn. DESC	Contact PIN M39029/	Pin (P) or Socket (S)	Contact size (mating end-wire barrel)	Wire range or cable	Crimp tool	Turret head positioner or die	Installing tool	Removal tool	Removal tool for unwired contacts
MIL-C-24308 REAR RELEASE CONTACTS	M24308/2-2 M24308/2-4 M24308/2-5	RECT.	63-368	S	20-20	20-24	M22520/2-01	M22520/2-08	M81969/39-01 (GREEN END)	M81969/39-01 (WHITE END)	
			63-368	S	20-20	20-24	M22520/2-01	M22520/2-08	M81969/39-01 (GREEN END)	M81969/39-01 (WHITE END)	
	M24308/2-281		M24308/16-4	S	8-8 (COAX)	RG58/U OR RG303/U	INNER CONTACT: M22520/2-01; M22520/2-08 OUTER FERRULE: M22520/5-01; Y289 (B)		M81969/14-04 (YELLOW END)	M81969/14-04 (WHITE END)	
	M24308/2-282		M24308/16-5	S	8-8 (COAX)	RG142/U OR RG223/U	INNER CONTACT: M22520/2-01; M22520/2-08 OUTER FERRULE: M22520/5-01; Y262 (A)		M81969/14-04 (YELLOW END)	M81969/14-04 (WHITE END)	
			63-368	S	20-20	20-24	M22520/2-01	M22520/2-08	M81969/39-01 (GREEN END)	M81969/39-01 (WHITE END)	
	M24308/2-283		63-368	S	8-8 (COAX)	RG178/U	INNER CONTACT: M22520/2-01; M22520/2-08 OUTER FERRULE: M22520/5-01; Y262 (C)		M81969/14-04 (YELLOW END)	M81969/14-04 (WHITE END)	
			63-368	S	20-20	20-24	M22520/2-01	M22520/2-08	M81969/39-01 (GREEN END)	M81969/39-01 (WHITE END)	
	M24308/2-284		M24308/16-2	S	8-8 (COAX)	RG174/U OR RG316/U	INNER CONTACT: M22520/2-01; M22520/2-08 OUTER FERRULE: M22520/5-01; Y262 (B)		M81969/14-04 (YELLOW END)	M81969/14-04 (WHITE END)	
				S	20-20	20-24	M22520/2-01	M22520/2-08	M81969/39-01 (GREEN END)	M81969/39-01 (WHITE END)	
	M24308/2-285		M24308/16-3	S	8-8 (COAX)	RG180/U	INNER CONTACT: M22520/2-01; M22520/2-08 OUTER FERRULE: M22520/5-01; Y289 (B)		M81969/14-04 (YELLOW END)	M81969/14-04 (WHITE END)	
	M24308/2-294		M24308/15-2	S	16-16 (COAX)	RG174/U OR RG316/U	INNER CONTACT: M22520/2-01; M22520/2-12 OUTER FERRULE: M22520/4-01; M22520/4-02		M81969/8-07	M81969/8-08	

TABLE I. Tool selection charts - Continued

Vendor (vendor code) connector series and type	Basic connector PIN	Conn. DESC	Contact PIN M39029/	Pin (P) or Socket (S)	Contact size (mating end-wire barrel)	Wire range or cable	Crimp tool	Turret head positioner or die	Installing tool	Removal tool	Removal tool for unwired contacts
MIL-C-24308 (CONTINUED) REAR RELEASE CONTACTS	M24308/4-2 M24308/4-4 M24308/4-5 M24308/4-259 M24308/4-260 M24308/4-261 M24308/4-262 M24308/4-263	RECT.	64-369	P	20-20	20-24	M22520/2-01	M22520/2-08	M81969/39-01 (GREEN END)	M81969/39-01 (WHITE END)	
MIL-C-26500 FRONT RELEASE CONTACTS	MS24265R08B3( ) MS24265R10B5( ) MS24266R08B3( )	CIRC.	31-241 32-260	P S	20-20	20-24	M22520/1-01 OR M22520/2-01	M22520/1-02 (RED) M22520/2-02	M81969/17-03	M81969/19-07	SAME
MIL-C-38999 SERIES IA (SCOOP-PROOF) REAR RELEASE CONTACTS	MS27467( )19( )35( ) MS27467( )23( )35( ) MS27468( )19( )35( ) MS27468( )23( )35( ) MS27656( )19( )35( ) MS27656( )23( )35( )		56-348 58-360	S P	22-22D 22-22D	22-28 22-28	M22520/2-01 M22520/2-01	M22520/2-07 M22520/2-09	M81969/8-01	M81969/8-02	DRK105-22M
MIL-C-38999 SERIES IIA (LOW-SILHOUETTE)	MS27473( )18( )11( ) MS27497( )18( )11( )	CIRC.	57-358 58-364	S P	16-16	16-20	M22520/1-01	M22520/1-04 (BLUE)	M81969/8-07	M81969/8-08	DRK105-16
	MS27473( )24( )61( ) MS27508( )24( )61( )		57-357 58-363	S P	20-20	20-24	M22520/1-01 OR M22520/2-01	M22520/1-04 (RED) M22520/2-10	M81969/8-05	M81969/8-06	DRK105-20
	MS27473( )8 ( )44( )		57-356 58-362	S P	22-22 22-22	22-26 22-26	M22520/2-01 M22520/2-01	M22520/2-06 M22520/2-09	M81969/8-03	M81969/8-04	DRK105-22
REAR RELEASE CONTACTS	MS27473( )18( )35( ) MS27473( )22( )35( ) MS27497( )18( )35( ) MS27497( )22( )35( ) MS27508( )18( )35( ) MS27508( )22( )35( )		57-354 58-360	S P	22-22D 22-22D	22-28 22-28	M22520/2-01 M22520/2-01	M22520/2-06 M22520/2-09	M81969/8-01	M81969/8-02	DRK105-22M

TABLE I. Tool selection charts - Continued

Vendor (vendor code) connector series and type	Basic connector PIN	Conn. DESC	Contact PIN M39029/	Pin (P) or Socket (S)	Contact size (mating end-wire barrel)	Wire range or cable	Crimp tool	Turret head positioner or die	Installing tool	Removal tool	Removal tool for unwired contacts
MIL-C-39012 BNC SERIES	M39012/16-0502	ST. PLUG	INNER CONTACT M39012/16-11	P	---	RG180/U	M22520/5-01	Y289(C)	---	---	
			OUTER FERRULE M39012/16-50	---	---	RG180/U	M22520/5-01	Y289(B)			
MIL-C-81511 SERIES 3 REAR RELEASE CONTACTS	M81511/41FD03( ) M81511/45FD03( ) M81511/46FD03( )		M39029/17-174	S	16-16	16-20	M22520/2-01	M22520/2-18	M81969/16-02 (BLUE END)	M81969/16-02 (WHITE END)	M81969/30-20 and -23
			M39029/18-179	P	16-16	16-20	M22520/2-01	M22520/2-15			
	M81511/41FD02( ) M81511/41FE02( ) M81511/45FE02( ) M81511/46FD02( ) M81511/46FE02( )		M39029/17-173	S	20-20	20-24	M22520/2-01	M22520/2-17	M81969/16-01 (RED END)	M81969/16-01 (WHITE END)	M81969/30-20 and -22
			M39029/18-178	P	20-20	20-24	M22520/2-01	M22520/2-14			
	M81511/41FG01( ) M81511/41FJ01( ) M81511/45FG01( ) M81511/45FJ01( ) M81511/46FG01( ) M81511/46FJ01( )		M39019/17-172	S	23-22	22-28	M22520/2-01	M22520/2-16	M81969/16-04 (GREEN END)	M81969/16-04 (WHITE END)	M81969/30-20 and -21
			M39029/18-177	P	23-22	22-28	M22520/2-01	M22520/2-13			
	M81511/41FH04( )	CIRC.	M39029/19-182 OR M39029/19-183	P	12-12 (SHIELDED)	CABLE GROUP A	INNER CONTACT M22520/2-01	M22520/2-29	M81969/16-03 (YELLOW END)	M81969/16-03 (WHITE END)	---
							SHIELD CRIMP SLEEVE				
					12-12 (SHIELDED)	CABLE GROUP B	MH804	DI2/1-1			
							OUTER CONTACT MH803	DI2P-1			
			M39029/18-180	P	12-12	UNWIRED	---	---	---	---	M81969/30-20 and -24
	M81511/46FH04( )		M39029/20-185 OR M39029/20-186	S	12-12 (SHIELDED)	CABLE GROUP A	INNER CONTACT M22520/2-01	M22520/2-29	M81969/16-03 (YELLOW END)	M81969/16-03 (WHITE END)	---
							SHIELD CRIMP SLEEVE				
					12-12 (SHIELDED)	CABLE GROUP B	MH804	DI2/2-1			
							OUTER CONTACT MH803	DI2LS-1			
			M39029/17-175	S	12-12	UNWIRED	---	---	---	---	M81969/30-20 and -24

CABLE GROUP A - RG180/U, MICRODOT 293-3922, RAYCHEM 95030D117
B - M81044/18-22, M27500-22RC1S6, REVERE WH95623, MICRODOT 250-4070, RAYCHEM 5022E5111

TABLE I. Tool selection charts - Continued

Vendor (vendor code) connector series and type	Basic connector PIN	Conn. DESC	Contact PIN M39029/	Pin (P) or Socket (S)	Contact size (mating end-wire barrel)	Wire range or cable	Crimp tool	Turret head positioner or die	Installing tool	Removal tool	Removal tool for unwired contacts
MIL-C-24308 (CONTINUED) REAR RELEASE CONTACTS	M24308/4-2 M24308/4-4 M24308/4-5 M24308/4-259 M24308/4-260 M24308/4-261 M24308/4-262 M24308/4-263	RECT.	64-369	P	20-20	20-24	M22520/2-01	M22520/2-08	M81969/39-01 (GREEN END)	M81969/39-01 (WHITE END)	
MIL-C-26500 FRONT RELEASE CONTACTS	MS24265R08B3( ) MS24265R10B5( ) MS24266R08B3( )	CIRC.	31-241 32-260	P S	20-20	20-24	M22520/1-01 OR M22520/2-01	M22520/1-02 (RED) M22520/2-02	M81969/17-03	M81969/19-07	SAME
MIL-C-38999 SERIES IA (SCOOP-PROOF) REAR RELEASE CONTACTS	MS27467( )19( )35( ) MS27467( )23( )35( ) MS27468( )19( )35( ) MS27468( )23( )35( ) MS27656( )19( )35( ) MS27656( )23( )35( )		56-348	S	22-22D	22-28	M22520/2-01	M22520/2-07	M81969/8-01	M81969/8-02	DRK105-22M
			58-360	P	22-22D	22-28	M22520/2-01	M22520/2-09			
MIL-C-38999 SERIES IIA (LOW-SILHOUETTE)	MS27473( )18( )11( ) MS27497( )18( )11( )	CIRC.	57-358 58-364	S P	16-16	16-20	M22520/1-01	M22520/1-04 (BLUE)	M81969/8-07	M81969/8-08	DRK105-16
	MS27473( )24( )61( ) MS27508( )24( )61( )		57-357 58-363	S P	20-20	20-24	M22520/1-01 OR M22520/2-01	M22520/1-04 (RED) M22520/2-10	M81969/8-05	M81969/8-06	DRK105-20
	MS27473( )8 ( )44( )		57-356 58-362	S P	22-22 22-22	22-26 22-26	M22520/2-01 M22520/2-01	M22520/2-06 M22520/2-09	M81969/8-03	M81969/8-04	DRK105-22
REAR RELEASE CONTACTS	MS27473( )18( )35( ) MS27473( )22( )35( ) MS27497( )18( )35( ) MS27497( )22( )35( ) MS27508( )18( )35( ) MS27508( )22( )35( )		57-354	S	22-22D	22-28	M22520/2-01	M22520/2-06	M81969/8-01	M81969/8-02	DRK105-22M
			58-360	P	22-22D	22-28	M22520/2-01	M22520/2-09			

TABLE I Tool selection charts - Continued

Vendor (vendor code) connector series and type	Basic connector PIN	Conn. DESC	Contact PIN M39029/	Pin (P) or Socket (S)	Contact size (mating end-wire barrel)	Wire range or cable	Crimp tool	Turret head positioner or die	Installing tool	Removal tool	Removal tool for unwired contacts
MIL-C-39012 BNC SERIES	M39012/16-0502	ST. PLUG	INNER CONTACT M39012/16-11	P	---	RG180/U	M22520/5-01	Y289(C)	---	---	
			OUTER FERRULE M39012/16-50	---	---	RG180/U	M22520/5-01	Y289(B)			
MIL-C-81511 SERIES 3 REAR RELEASE CONTACTS	M81511/41FD03( ) M81511/45FD03( ) M81511/46FD03( )		M39029/17-174 M39029/18-179	S P	16-16 16-16	16-20 16-20	M22520/2-01 M22520/2-01	M22520/2-18 M22520/2-15	M81969/16-02 (BLUE END)	M81969/16-02 (WHITE END)	M81969/30-20 and -23
	M81511/41FD02( ) M81511/41FE02( ) M81511/45FE02( ) M81511/46FD02( ) M81511/46FE02( )		M39029/17-173 M39029/18-178	S P	20-20 20-20	20-24 20-24	M22520/2-01 M22520/2-01	M22520/2-17 M22520/2-14	M81969/16-01 (RED END)	M81969/16-01 (WHITE END)	M81969/30-20 and -22
	M81511/41FG01( ) M81511/41FJ01( ) M81511/45FG01( ) M81511/45FJ01( ) M81511/46FG01( ) M81511/46FJ01( )		M39019/17-172 M39029/18-177	S P	23-22 23-22	22-28 22-28	M22520/2-01 M22520/2-01	M22520/2-16 M22520/2-13	M81969/16-04 (GREEN END)	M81969/16-04 (WHITE END)	M81969/30-20 and -21
	M81511/41FH04( )	CIRC.	M39029/19-182 OR M39029/19-183	P	12-12 (SHIELDED)	CABLE GROUP A	INNER CONTACT M22520/2-01 SHIELD CRIMP SLEEVE MH804 OUTER CONTACT MH803	M22520/2-29 DI2/1-1 DI2P-1	M81969/16-03 (YELLOW END)	M81969/16-03 (WHITE END)	---
					12-12 (SHIELDED)	CABLE GROUP B					
			M39029/18-180	P	12-12	UNWIRED	---	---	---	---	M81969/30-20 and -24
	M81511/46FH04( )		M39029/20-185 OR M39029/20-186	S	12-12 (SHIELDED)	CABLE GROUP A	INNER CONTACT M22520/2-01 SHIELD CRIMP SLEEVE MH804 OUTER CONTACT MH803	M22520/2-29 DI2/2-1 DI2LS-1	M81969/16-03 (YELLOW END)	M81969/16-03 (WHITE END)	---
					12-12 (SHIELDED)	CABLE GROUP B					
			M39029/17-175	S	12-12	UNWIRED	---	---	---	---	M81969/30-20 and -24

CABLE GROUP A - RG180/U, MICRODOT 293-3922, RAYCHEM 95030D117
B - M81044/18-22, M27500-22RC1S6, REVERE WH95623, MICRODOT 250-4070, RAYCHEM 5022E5111

TABLE I. Tool selection charts - Continued

Vendor (vendor code) connector series and type	Basic connector PIN	Conn. DESC	Contact PIN M39029/	Pin (P) or Socket (S)	Contact size (mating end-wire barrel)	Wire range or cable	Crimp tool	Turret head positioner or die	Installing tool	Removal tool	Removal tool for unwired contacts
MIL-C-83723 SERIES 2 AND MIL-C-5015 REAR RELEASE CONTACTS	MS3450 thru MS3459 and M83723/17 thru /24 and /52 & /53	CIRC.	4-110	P	20-20	20-24	M22520/1-01 OR M22520/2-01	M22520/1-02 (RED) M22520/2-02	M81969/14-02 (RED END)	M81969/14-02 (WHITE END)	M81969/30-20 and -25 (RED TIP)
			5-115	S							
			4-111	P	16-16	16-20	M22520/1-01	M22520/1-02 (BLUE)	M81969/14-03 (BLUE END)	M81969/14-03 (WHITE END)	M81969/30-20 and -26 (BLUE TIP)
			5-116	S							
			4-110	P	20-20	20-24	M22520/1-01	M22520/1-02 (RED)	M81969/14-02 (RED END)	M81969/14-02 (WHITE END)	M81969/30-20 and -25 (RED TIP)
			5-115	S							
			4-111	P	16-16	16-20	M22520/1-01	M22520/1-02 (BLUE)	M81969/14-03 (BLUE END)	M81969/14-03 (WHITE END)	M81969/30-20 and -26 (BLUE TIP)
			5-116	S							
MIL-C-83723 SERIES 3 REAR RELEASE CONTACTS	M83723-( )1808( ) M83723-( )2212( )	CIRC.	4-113	P	12-12	12-14	M22520/1-01	M22520/1-02 (YELLOW)	M81969/14-04 (YELLOW END)	M81969/14-04 (WHITE END)	M81969/30-20 and -27 (YELLOW END)
			5-118	S							
	M83723-( )1814( )		4-111	P	16-16	16-20	M22520/1-01	M22520/1-02 (BLUE)	M81969/14-03 (BLUE END)	M81969/14-03 (WHITE END)	M81969/30-20 and -26 (BLUE TIP)
			5-116	S							
	M83723-( )2028( )		4-113	P	12-12	12-14	M22520/1-01	M22520/1-02 (YELLOW)	M81969/14-04 (YELLOW END)	M81969/14-04 (WHITE END)	M81969/30-20 and -27 (YELLOW TIP)
			5-118	S							
			4-110	P	20-20	20-24	M22520/1-01 OR M22520/2-01	M22520/1-02 (RED) M22520/2-02	M81969/14-02 (RED END)	M81969/14-02 (WHITE END)	M81969/30-20 and 25 (RED TIP)
			5-115	S							

TABLE I. Tool selection charts - Continued

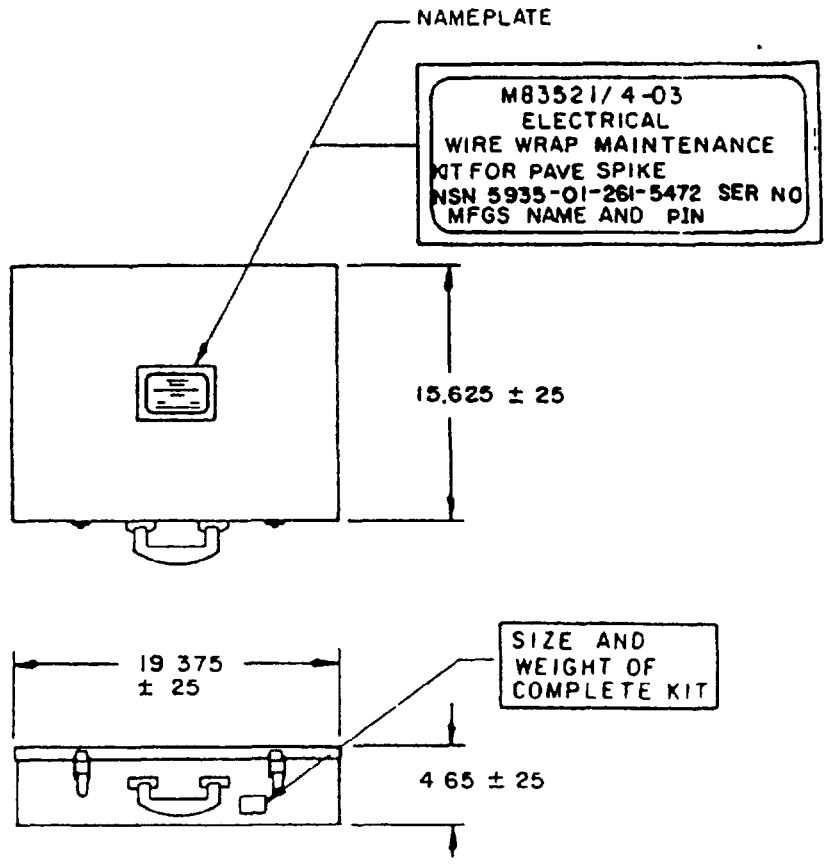
Vendor (vendor code) connector series and type	Basic connector PIN	Conn. DESC	Contact PIN M39029/	Pin (P) or Socket (S)	Contact size (mating end-wire barrel)	Wire range or cable	Crimp tool	Turret head positioner or die	Installing tool	Removal tool	Removal tool for unwired contacts
AMPHENOL "BNC" SERIES	31-242 31-245	PLUG & JACK				CABLE GROUP C	INNER CONTACT M22520/5-01 OUTER FERRULE M22520/5-01	Y289(C) Y289(B)	N.A.	N A	N.A
BENDIX "DO" SERIES THREADED COUPLING	DO6P-9-12S	CIRC.	N.A.	S	22-22M	24-28	SOLDER		N.A.	N A.	N.A
	DO7A-9-12P		N.A.	P	22-22M	24-28	SOLDER		N.A.	N.A.	N.A.
	DO6P-11-22S		N.A	S	22-22M	24-28	SOLDER		N.A.	N.A.	N.A.
	DO7A-11-22P		N.A.	P	22-22M	24-28	SOLDER		N.A.	N A.	N.A
BENDIX "LB" SERIES	BENDIX P/N NOT ASSIGNED (582R612H01)	RECT.	21-33051-1	S	12-12 (SHIELDED)	RG180/U	INNER CONTACT M22520/2-01 OUTER FERRULE M22520/31-01	K323 M22520/31-02	M81969/8-09	M81969/8-10	DRK105-12
			21-33051-23 OR 21-33051-24	S	16-16 (SHIELDED)	CABLE GROUP D OR RG178/U	INNER CONTACT M22520/2-01 OUTER FERRULE M22520/4-01	M22520/2-12 M22520/4-02	M81969/8-07	M81969/8-08	DRK105-16
REAR RELEASE CONTACTS	BENDIX P/N NOT ASSIGNED (582R612H02)	RECT.	21-33052-1	P	12-12 (SHIELDED)	RG180/U	INNER CONTACT M22520/2-01 OUTER FERRULE M22520/31-01	K323 M22520/31-02	M81969/8-09	M81969/8-10	DRK105-12
			21-33052-23 OR 21-33052-24	P	16-16 (SHIELDED)	CABLE GROUP D OR RG178/U	INNER CONTACT M22520/2-01 OUTER FERRULE M22520/4-01	M22520/2-12 M22520/4-02	M81969/8-07	M81969/8-08	DRK105-16
BENDIX "JT" SERIES	JT00RP1835SB JTN00RE1835S JTN00RE2235S	CIRC.	M39029/57-534	S	22-22D	22-28	M22520/2-01	M22520/2-06	M81969/8-01	M81969/8-02	DRK105-22M
REAR RELEASE CONTACTS	JT02A-18-11P	CIRC.	M39029/58-364	P	16-16	16-20	M22520/1-01	M22520/1-04 (BLUE)	M81969/8-07	M81969/8-08	DRK105-16

CONNECTOR PIN'S IN PARENTHESIS ( ) ARE WESTINGHOUSE PIN'S AND ARE PRECEDED BY FSCM CODE NO "97942"
CABLE GROUP C - RG161/U, RG179/U, RG187/U
CABLE GROUP D - RG174/U, RG179/U, RG316/U

TABLE I. Tool selection charts - Continued

Vendor (vendor code) connector series and type	Basic connector PIN	Conn. DESC	Contact PIN M39029/	Pin (P) or Socket (S)	Contact size (mating end-wire barrel)	Wire range or cable	Crimp tool	Turret head positioner or die	Installing tool	Removal tool	Removal tool for unwired contacts
BENDIX "LB" SERIES REAR RELEASE CONTACTS	LBDMA-50PG02	RECT.	64-369	S	20-20	20-24	M22520/2-01	M22520/2-08	M81969/39-01 (GREEN END)	M81969/39-01 (WHITE END)	
	LBDMA-50SG11		63-368	P							
CINCH OR ITT CANNON "D&M" SERIES FRONT RELEASE COAX	DAM-3W( ) DAM-7W2( ) DBM-9W4( ) DDM-24W7( )	RECT.	N.A.	P OR S	20-20	20-24	SOLDER TYPE		N.A.	N A.	N A.
			SEE NOTE 1	P OR S	COAX	SEE NOTE 1	SOLDER TYPE		NONE REQ'D	CET-C6B	SAME
DEUTSCH "DM" SERIES FRONT RELEASE CONTACTS	DM5605-61-21( )	CIRC.	SEE NOTE 1 (582R670H02)	P	8-8 (COAX)	SEE NOTE 1	INNER CONTACT M22520/2-01 K30C; OUTER FERRULE M22520/5-01 Y262(B)		DAK51-8	DAK51-8	SAME
			(582R670H03) OR (582R670H04)	S							
			(582R670H05)	P	8-8 (COAX)	SEE NOTE 1	INNER CONTACT M22520/2-01 K30C; OUTER FERRULE M22520/5-01 Y289(B)				
				S							
REYNOLDS HIGH-VOLTAGE CONNECTOR	167-9929	CIRC.	INNER CONTACT 167-6160	P	N.A.	SEE NOTE 1	SOLDER		N.A.	N A	N.A
			OUTER FERRULE 167-4156	N.A.	N.A.		M22520/5-01	Y289(A)			
	167-9930	CIRC.	INNER CONTACT 167-6159	S	N.A.	SEE NOTE 1	SOLDER		N.A.	N.A	N A.
			OUTER FERRULE 167-4156	N.A.	N.A.		M22520/5-01	Y289(A)			

NOTE 1 - CONTACT AND/OR CABLE AS SPECIFIED BY WESTINGHOUSE



Inches	mm
4.65	118.1
15.625	396.90
19.375	492.10

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ±.125 (3.18 mm).
4. Remove all burrs, break sharp edges and corners.
5. PIN M83521/4-03 includes case assembly and tools.
6. Maximum weight 17 pounds 8 ounces.

FIGURE 24. Electrical wire wrap maintenance kit for pave spike.

ELECTRICAL WIRE WRAP MAINTENANCE KIT

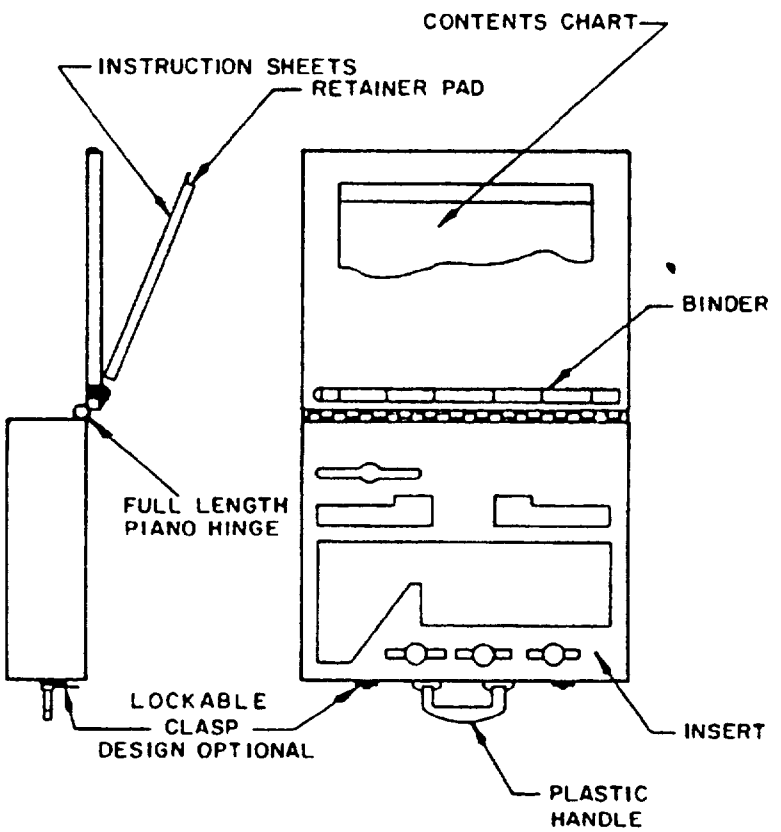
(1) M83521/4-03 - Tool case assembly plus all tools.

PARTS LIST:

(1) M83521/4-04 - Tool case assembly.
(1) Gardner-Denver 14XA2-B3C-28 or Standard Pneumatic 615-1-28 1/
Electrical powered wire wrap tool
(1) Gardner-Denver 505244 or Standard Pneumatic 693 1/ Unwrap tool
(1) Gardner-Denver 507100 or Standard Pneumatic 60341 1/ Wrap sleeve
(1) Gardner-Denver 506445 or Standard Pneumatic 52634 1/ Wrap bit
(1) Gardner-Denver 507573 or Standard Pneumatic 53126 1/ Wrap bit
(1) Each OK Tool and Machine ST100-26 and ST100-30 1/ Stripping tool
OR
(1) Gardner-Denver 525653 1/ Double ended stripping tool
(1 set) Contents charts and instruction sheets.

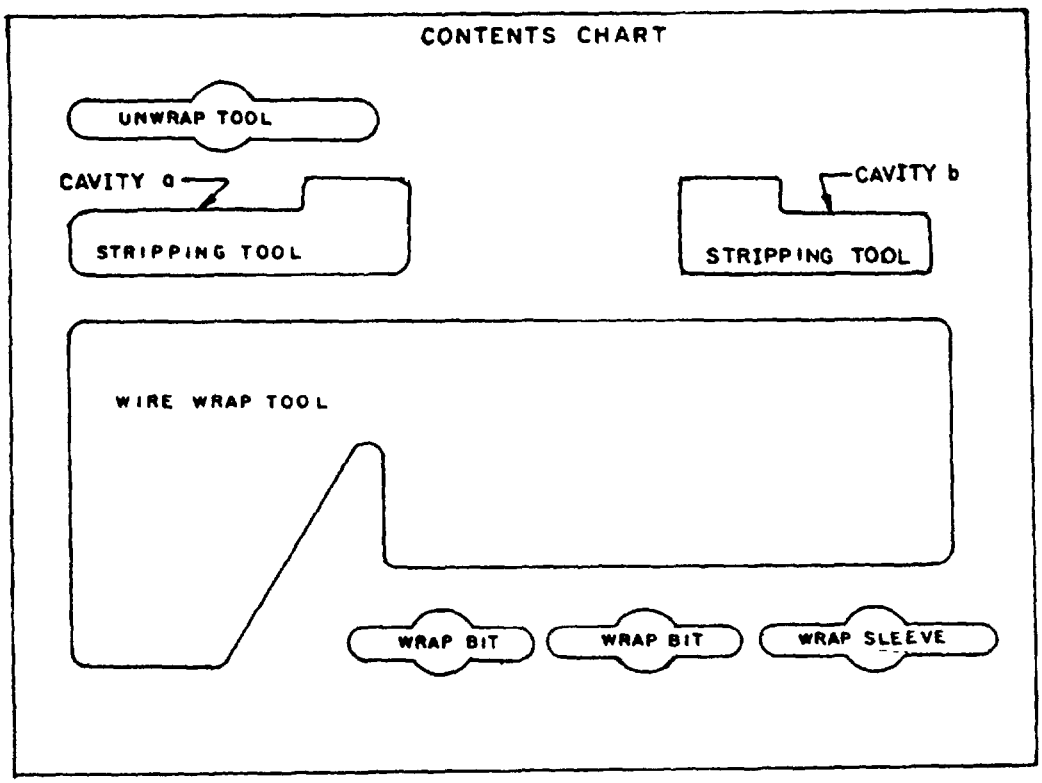
1/ Approved equivalent parts may be used in lieu of specified parts but must be approved in advance by the 2750th ABW-ESP Gentile AFS, Ohio 45444, telephone number 513-296-5534 or Autovon 986-5534.

FIGURE 24. Electrical wire wrap tool kit for pave spike - Continued.



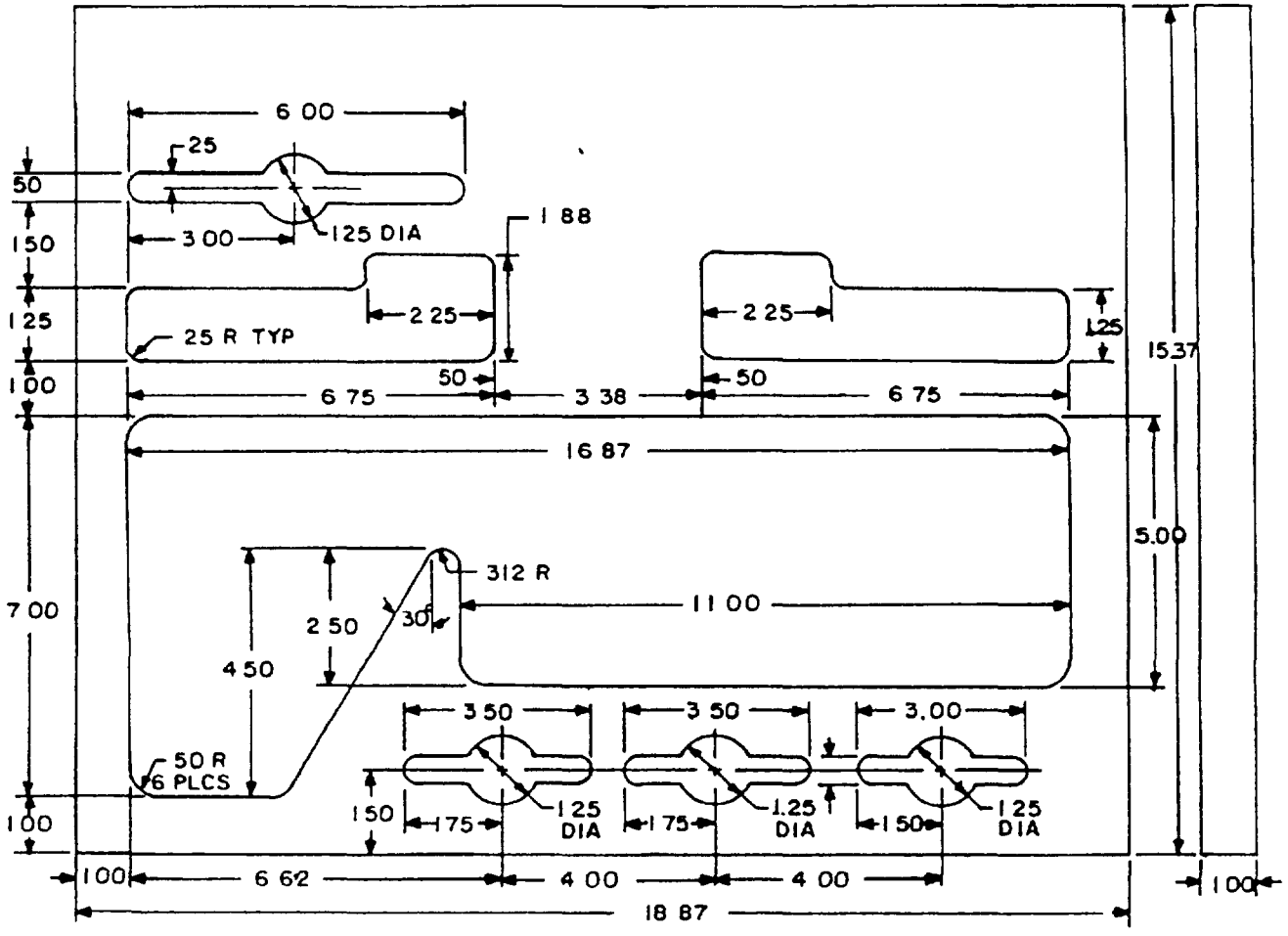
NOTES.
1. See figure 24, note 4.
2. PIN M83521/4-04 for case only (tools not included).

FIGURE 25. Tool case assembly M83521/4-04.



NOTES:
1. See figure 24, for parts list.
2. When stripping tool PIN 525653 is supplied, cavity b shall be plugged with polyethylene insert material as specified in the requirements section. When stripping tool PIN ST100-26 and ST100-30 are supplied, both cavities a and b shall contain one tool each.

FIGURE 26. Contents chart for M83521/4-03.



NOTES:
1. Dimensions are in inches
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ±.125 (3.18 mm).
4. Remove all burrs.
5 See figure 26, note 2.

Inches	mm	Inches	mm
.250	6.35	3.50	88.9
.312	7.93	4.00	101.6
.500	12.70	4.50	114.3
1.00	25.4	5.00	127.0
1.250	31.75	6.00	152.4
1.50	38.1	6.620	168.15
1.750	44.45	6.750	171.45
1.880	47.75	7.00	177.8
2.250	57.15	11.00	279 4
2.50	63.5	15.73	390 4
3.00	76.2	16.87	428 5
3.380	85.85	18.87	479 3

FIGURE 27 Insert for M83521/4-04

The Wire Wrap Insulation Stripper is ideal for repair service, prototype breadboarding, hobbyist, and limited production assembly.

This stripper is available in both single and two-wire size construction. Thermoplastic insulations are easily removed from solid conductor wire to prepare for wire wrapping or other methods of electrical termination.

To use, push the insulated wire through the ferrule to the desired strip length and a quick pull will remove the insulation. The stripped piece of insulation is pushed out of the stripper by the next wire insertion.

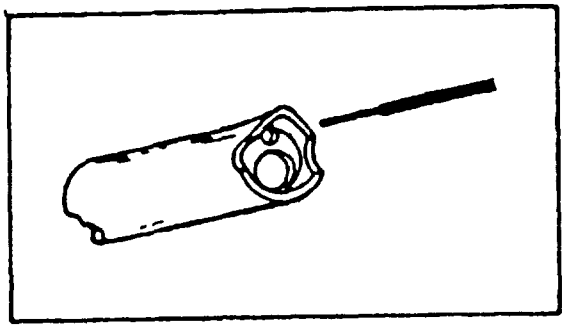
Option 1/	Stripping tool PIN	Wire size AWG	Construction	Maximum insulation diameter		Color code
				inch	mm	
a	525653	26 30	Double end	.0315 .0225	0.80 0.57	Red Blue
b	ST100-26 ST100-30	26 30	Single end Single end	.0315 .0225	0.80 0.57	Red Blue

1/ This kit is supplied with one of the options listed.
a - one each: 525653 or,
b - one each: ST1200-26 and one each ST100-30.

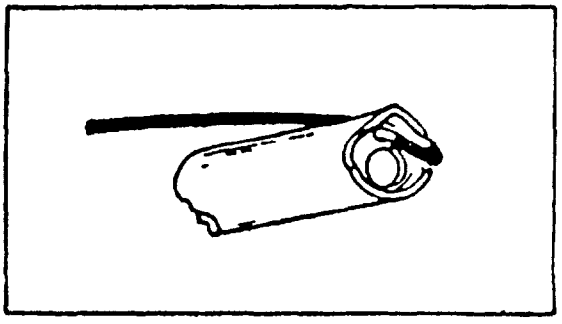
NOTES:
1. Dimensions are in inches.
2 Metric equivalents are given for general information only.
3. When doubled ended tool is supplied, the right hand stripping tool cavity shall be plugged with polyethylene insert material as specified in the requirements section.

FIGURE 28. Wire wrap instructions.

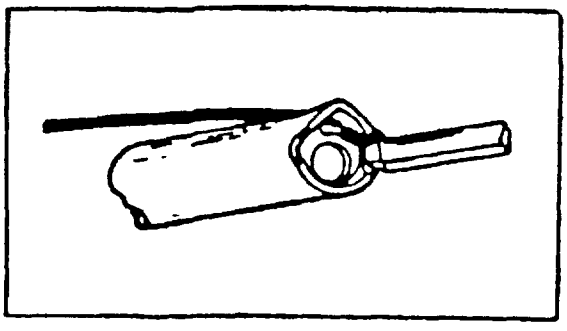
There are four simple steps involved in making mechanically and electrically sound solderless wrapped connections.



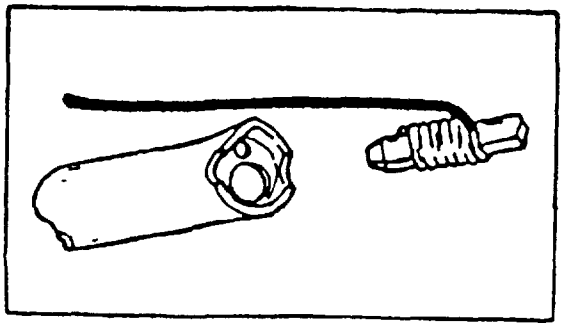
STEP 1
Insertion of the pre-stripped wire into the wire slot of the wrapping bit.



STEP 2
Anchoring of the wire in the notch of the wrapping sleeve.



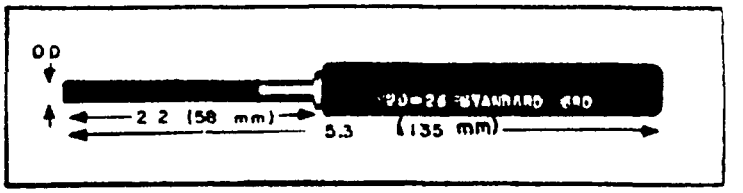
STEP 3
Insertion of terminal into the center hole of the wrapping bit.



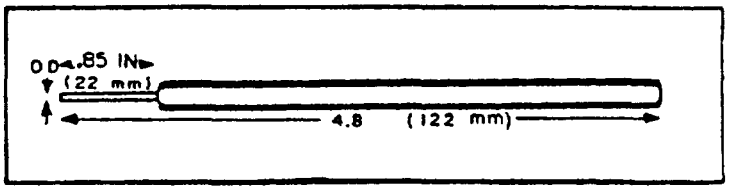
STEP 4
Finished wrap is achieved by activating the wire wrapping tool which rotates the wrapping bit and wraps the wire around the terminal.

FIGURE 28 Wire wrap instructions - Continued.

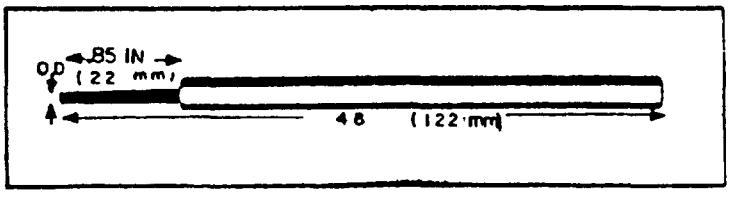
Type A
These tools have plastic handles with a spring loaded insulated sleeve for ease of wire pick-up and removal of close connections without damaging the terminal or adjacent connections.



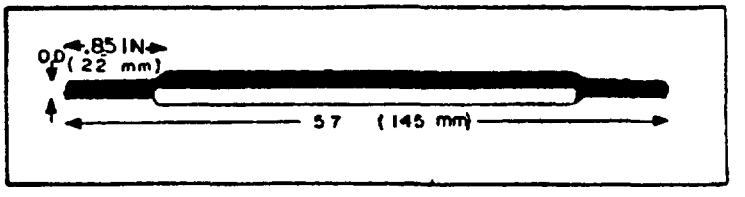
Type B
This aluminum handle tool is designed to unwrap tight matrices where a very slim profile is required. Tool will retain wire in sleeve and remove from pin. Will unwrap in both left and right hand direction.



Type C
The spiral unwrappers give clear visibility and allow delicate operator control. Handle is 1/4 inch Hex anodized aluminum.

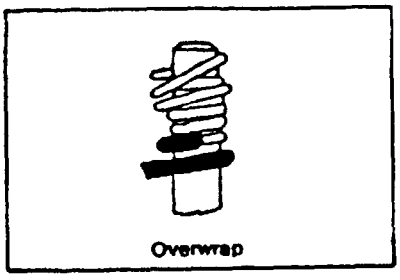


Type D
A double ended version of the type C tool for unwrapping in both left and right hand direction.

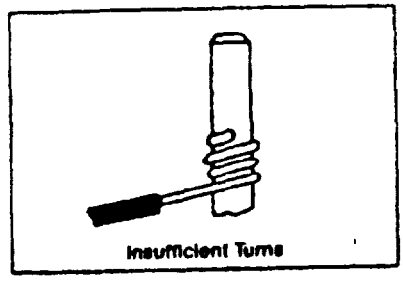


Type	Wire size	Unwrapping direction	Term. hole dia.		Term. hole depth		Outside dia.	
			Inch	mm	Inch	mm	Inch	mm
A	20-26 AWG	Left hand	.070	1.78	1.2	30.5	.200	5.08
A	20-26 AWG	Left or Right hand	.070	1.78	1.2	30.5	.200	5.08
A	28-32 AWG	Left hand	.040	1.02	.75	19	.140	3.56
A	28-32 AWG	Left or Right hand	.040	1.02	.75	19	.140	3.56
B	28-32 AWG	Left or Right hand	.040	1.02	.63	16	.095	2.41
C	20-26 AWG	Left hand	.070	1.78	1	25.4	.125	3.18
C	26-32 AWG	Left or Right hand	.040	1.02	.75	19	.088	2.24
D	20-26 AWG	Left or Right hand	.070	1.78	1	25.4	.125	3.18
D	26-32 AWG	Left or Right hand	.040	1.02	.75	19	.088	2.24
C	20-26 AWG	Left hand	.070	1.78	1	25.4	.156	3 96

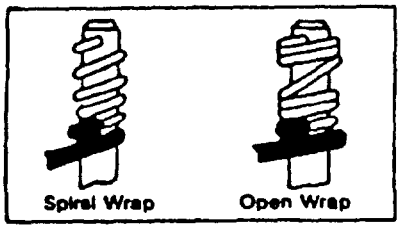
FIGURE 29. Unwrapping tool instructions.



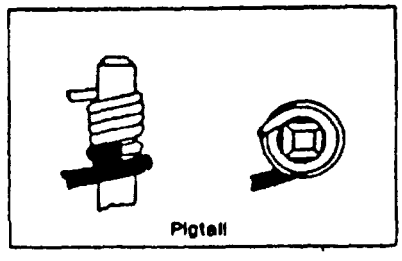
DON'T PRESS TOO HARD!
Pressing down too hard on the tool during the wire wrapping operation results in "over-wrapping", where one or more turns of wire can slip over the preceding turns. An Anti-Backforce device is helpful in preventing overwrap.



PUSH WIRE ALL THE WAY INTO WIRE SLOT!
Improper feeding of wire into the wire slot of the bit results in insufficient turns of wire for regular wraps or insufficient insulation turns for modified wraps.



DON'T REMOVE TOOL TO QUICKLY!
Removal of the wrapping tool before the wrap is completed can result in "spiral" or "open" wraps, where one turn of wire is more than .005" from another turn. "Pigtails" where the final turn of wire is not completely wrapped are also caused by too rapid a removal of the wrapping too. An Anti-Backforce will help reduce this problem.



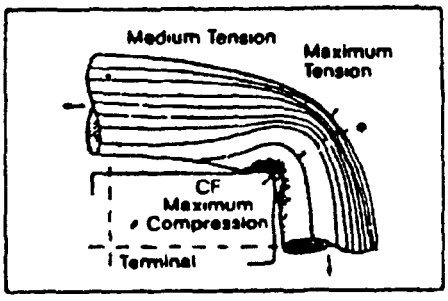
SELECT PROPER BIT AND SLEEVE!
The particular wire wrapping bit and sleeve selected depends among other criteria upon the size (terminal diagonal) of the terminal to be wrapped. If the terminal hole diameter of the bit is improperly matched to the terminal diagonal, defects ranging from loose turns or deformed wire "pigtails", can result

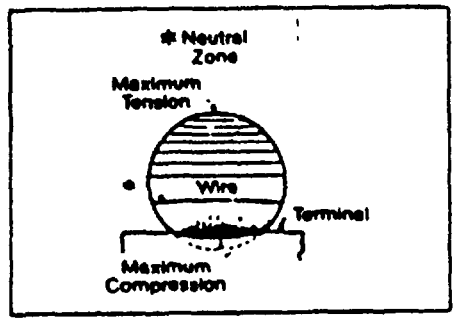
RECOMMENDED VALUES FOR MINIMUM STRIP FORCE

Wire size			Number of turns of bare wire	Strip force (minimum)	
AWG	Diameter inches	Diameter mm		Pounds	GMS
18	.0403	1.02	4	15	5600
20	.0320	0.81	4	8	3600
22	.0253	0.64	5	8	3600
24	.0201	0.51	5	7	3200
26	.0159	0.40	6	6	2700
28	.0126	0.32	6	4	1880
30	.0100	0.25	7	3	1850
32	.0080	0.20	8	3	1650

If test falls below values shown in above chart, replace with new Standard Pneumatic bit.

FIGURE 30 Operator problems.





DISTRIBUTION OF STRESS

By bending the wire around the sharp corner of the terminal the oxide layer on both wire and terminal is crushed or sheared, and a clean, oxide-free metal-to-metal contact is obtained.

Cross section through the terminal edge shows stress distribution produced in the wire wrapped with high tension around a terminal.

EASY REMOVAL

Although wire wrapped connections are quick and permanent, having superior mechanical and electrical qualities, they may be easily removed if necessary without damage to the terminal.

To remove the connection an unwrapping tool is placed over the terminal, engaging the first turn of the connection. Rotation of tool removes the connection in seconds.

QUALITY ASSURANCE

1 Pull Test - consists of a stripping or removal test which is performed to check that the wire is being wound tightly enough around the terminal.

2. Unwrapping Test - determines whether or not the wire is being wound too tightly around the terminal. This is done by unwrapping the wire from the terminal - if the wire breaks during the unwrap test, it has been wound too tightly and the wire wrapping bit should be rejected.

FIGURE 30. Operating problems - Continued.

REQUIREMENTS

Design and configuration See figures 1 through 6 and figures 24 through 27.

Materials
Case (category 2) (M83521/4-03): Fiberglass with an aluminum frame (Skydyne) PIN SK672900-19 or equal, olive drab in accordance with FED-STD-595.
Case and cover (category 3) (M83521/4-04): Sheet metal, 21 gauge in accordance with QQ-S-698, olive drab in accordance with FED-STD-595.
Cover and components (M83521/4-02): Aluminum alloy, clear anodized in accordance with MIL-A-8625.
Instruction sheets and contents charts: White vinyl .020 (0.51 mm) thick.
Insert and retainer pad: Fire retardant foamed polyethylene in accordance with PPP-C-1752; color is optional.

Clasps, handles, hinges, and locking hasp (M83521/4-02): Suitable plated to resist corrosion.

Clasps (M83521/4-04): Draw pull type with provision for using a locking device.

Binder (M83521/4-04). Binder, looseleaf, six rings .562 (14.27 mm) +.062 (1.57 mm) I.D., securely riveted to inside of cover (see figure 25).

Nameplate: In accordance with MIL-P-19834.

Cover (M83521/4-02): A retainer pad shall be permanently affixed to the underside with contents chart insert and a latching mechanism shall be provided so that when the cover is closed the tools will be captivated in their respective positions.

Automatic air pressure relief valve (M83521/04-01): Located adjacent to handle. Decal with, "Relief valve automatic, two way, press button to equalize pressure", shall be attached to case adjacent to valve.

Rubber feet (M83521/4-01): Provided on the back and bottom of case (see figure 1).

Instruction sheets and contents charts. Lettering shall be legible and protected with a transparent coating. (See figures 5 through 23 for M83521/4-02 and figures 24 through 27 for M83521/4-04).

Contents charts: Pressure sensitive adhesive backing, show the insert cavity configurations and respective tool PINs; a list of NSN's will also be supplied.
M83521/4-02 - Centered on inside of top and bottom tool case flyleaf

PIN:
M83521/4-01 - Maintenance kit for pave system.
M83521/4-02 - Maintenance case assembly.
M83521/4-03 - Electrical wire wrap maintenance kit for pave spike.
M83521/4-04 - Maintenance case assembly. For wire wrap maintenance kit.

Supersession data:

Previous PIN	Superseded by
M83507/12-01	M83521/4-01
M83507/12-02	M83521/4-02
M83507/12-03	M83521/4-03
M83507/12-04	M83521/4-04

CONCLUDING MATERIAL

Custodian:
Air Force - 85

Review activities:
Air Force - 11, 99
DLA - ES

User activity:
Air Force - 19

Preparing activity:
Air Force - 85

Agent.
DLA - ES

(Project 5935-F387)