

SCTR SERIES ADJUSTABLE TENSION SAFE-T-CABLE® APPLICATION TOOL

DMC DANIELS
MANUFACTURING
CORPORATION
DATASHEET

SEE PAGE 14 FOR IMPORTANT INFORMATION CONCERNING
LIMITED WARRANTY, AND LIMITATION OF LIABILITY.

INTRODUCTION

The Daniels SCTR Series Safe-T-Cable® application tool is designed to terminate ferrules to Safe-T-Cable® in accordance with SAE specification AS4536*. The application tool installs Safe-T-Cable® kits identified in SAE specifications AS3509*, AS3510* and AS3511*.

The following steps are important to assure proper Safe-T-Cable® applications:

1. Proper Tool Settings (section 1.0)
2. Proper Cable Installation (section 2.0)
3. Proper Loading and use of the application tool (section 3.0)
4. Verification of proper application (section 4.0)

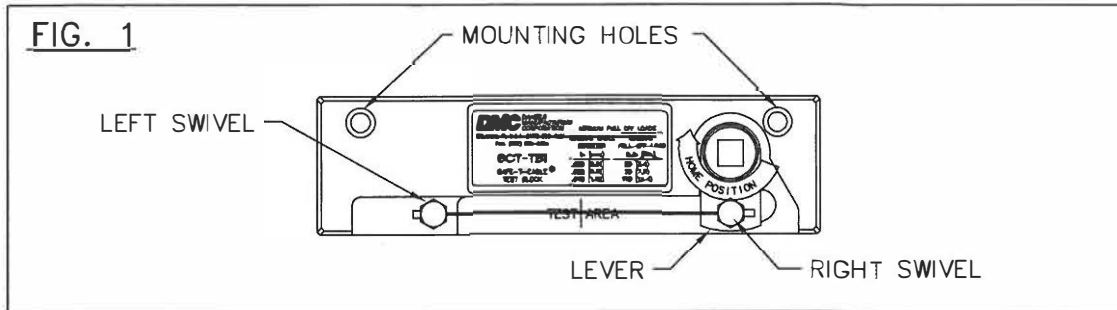
* SAE publications are available from:
SAE, International
400 Commonwealth Drive
Warrendale, PA 15096-0001 U.S.A.

1.0 TOOL MAINTENANCE AND VERIFICATION OF TOOL SETTINGS

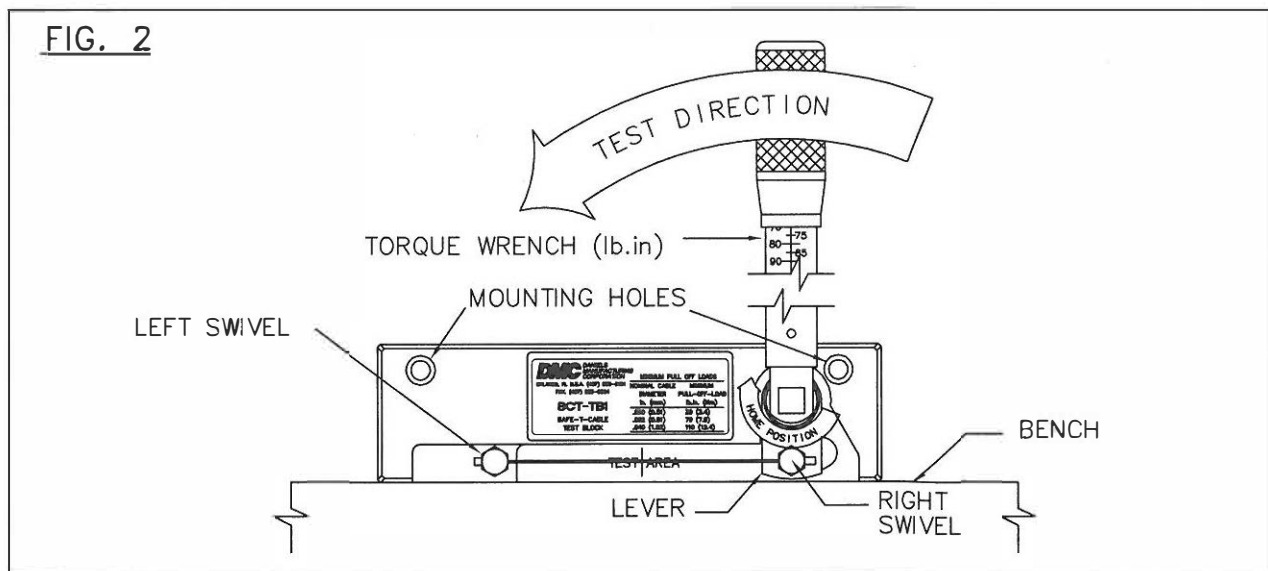
1.1 CHECKING INDENTER SETTINGS WITH THE DANIELS SCT-TB1 TORQUE VERIFICATION BLOCK

- 1.1.1 Indenter settings should be checked periodically and must be checked after the nose assembly has been removed or interchanged.
- 1.1.2 Thread the cable into the left swivel and through the right swivel, holding the lever in the home position as shown in FIG. 1. If the lever is not kept in the home position the results may be adversely affected. Terminate the cable per section 3.0, making sure to close the handles completely.
- 1.1.3 Apply approximately 2 lb. force to the cable with your finger (or use the Daniels SCTD013 Retention Tester) at the line marked "TEST AREA". If the cable touches either the side or bottom surface of the test area, remove the cable from the Test Block and adjust the cable tension per Section 1.3. Terminate another cable as described above, making sure that the tool nose is perpendicular to the fastener as shown in Figure 14. Repeat this procedure until the cable does not touch either the side or bottom surfaces of the test area.
- 1.1.4 Place a calibrated 3/8" drive inch-pound torque wrench (Daniels SCTD0001) into the square drive hole of the lever, orienting the test block and torque wrench on a flat surface as shown in FIG. 2. Apply the proper pull-off load as shown in table 2.

**CAUTION: RELEASE TORQUE WHEN MINIMUM PULL-OFF LOAD IS ACHIEVED.
DO NOT APPLY ADDITIONAL TENSION TO THE CABLE.**

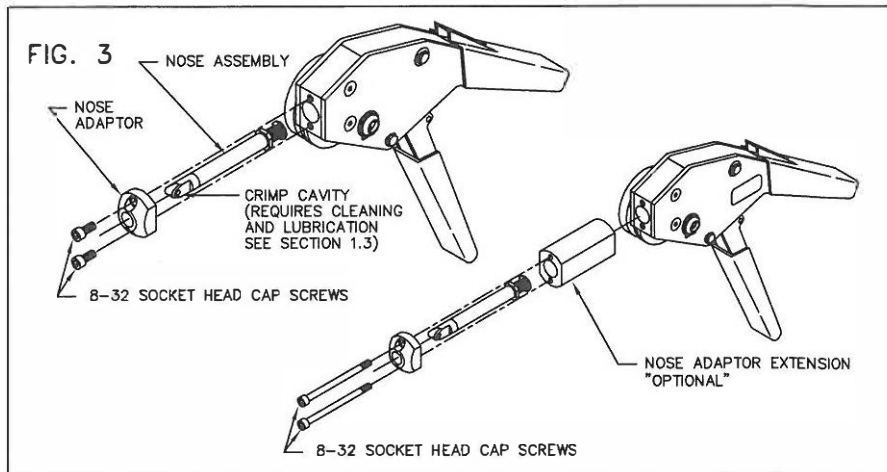


- 1.1.5 If the cable did not break or pull out of the ferrule after applying proper torque, remove the torque wrench and apply approximately 2 lb. force to the cable with your finger (or Daniels SCTD013) at the line marked "TEST AREA".
- 1.1.6 If the cable breaks or pulls out of the ferrule, or it touches either the side or bottom surface of the test area, then the crimp is unacceptable and the tool indenter should be adjusted per section 1.2.



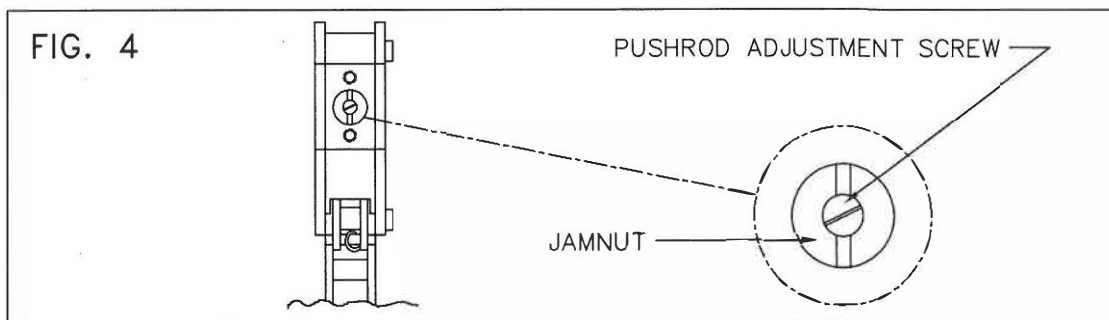
1.2 INDENTER ADJUSTMENT

- 1.2.1 Remove the nose assembly by removing the two 8-32 socket head cap screws and nose adapter as shown in Fig. 3. The nose adapter extension may be used with the SCTR series tool frame and SCTN series noses. Install the adaptor extension as shown in Figure 3.
- 1.2.2 Unlock the jamnut using the SCT32084 tool, and adjust the pushrod screw using a 1/4" straight edge screwdriver (see Fig. 4). Turn the pushrod adjustment screw clockwise to loosen the crimp (enlarge gaging dimensions). Turn the adjustment screw counterclockwise to tighten the crimp (reduce the gaging dimensions). After each adjustment, securely tighten the jam screw using the SCT32084 tool (while holding the adjustment screw stationary with the screwdriver) prior to the installation of the nose assembly.



- 1.2.3 Replace the nose assembly and the two 8-32 socket head cap screws. Prevent binding by alternately turning each screw a small amount until tight.
- 1.2.4 Check the calibration as described in section 1.1.

CAUTION: TIGHTENING THE CRIMP INCREASES REQUIRED HAND FORCES DURING APPLICATION AND INCREASES CABLE ASSEMBLY TENSILE VALUES. LOOSENING THE CRIMP DECREASES REQUIRED HAND FORCES DURING APPLICATION AND DECREASES CABLE ASSEMBLY TENSILE VALUES. DO NOT ADJUST THE PUSHROD MORE THAN A QUARTER OF A TURN AT A TIME. SEVERE ADJUSTMENTS MAY DAMAGE THE TOOL.

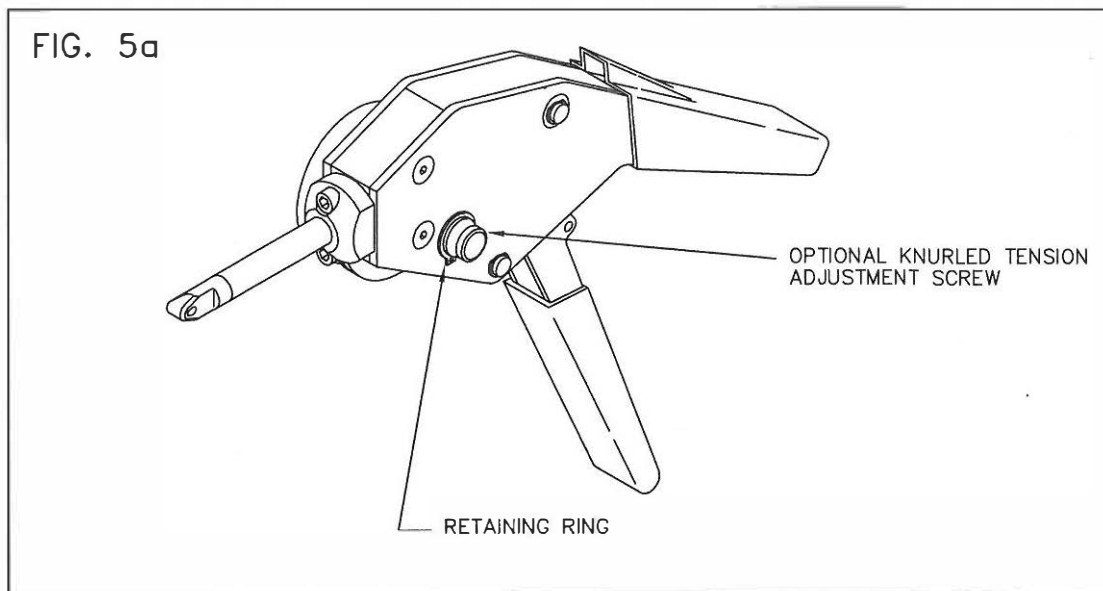
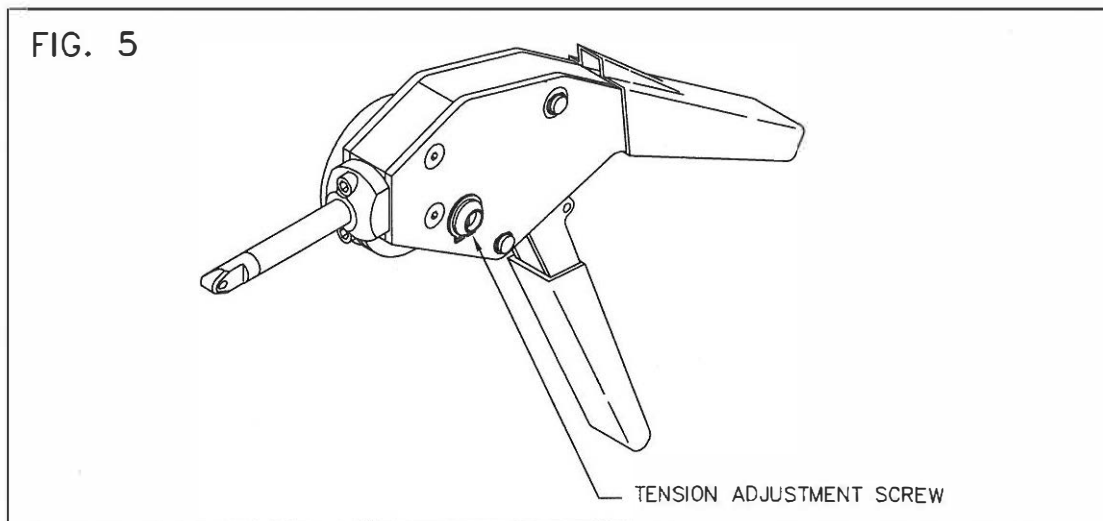


1.3 MAINTENANCE OF THE CRIMP CAVITY

- 1.3.1 Debris can accumulate in the crimp cavity during use. This debris must be removed and the cavity oiled periodically depending upon use and environment. Ferrule sticking can occur if this procedure is not followed (see Fig. 3).
- 1.3.2 Remove debris by gently scraping or brushing the crimp cavity. Blow any remaining debris from the cavity with air.
- 1.3.3 Coat the cavity with a light film of any lightweight synthetic or petroleum based oil after the cavity has been thoroughly cleaned.

1.4 ADJUSTING CABLE TENSION

- 1.4.1 Adjust cable tension using a 1/4" straight edge screwdriver (see Fig 5). Turn the tension adjustment screw clockwise to increase cable tension or counterclockwise to decrease cable tension. See Table 1 for allowable flex limits. Do not adjust cable tension tighter than necessary.



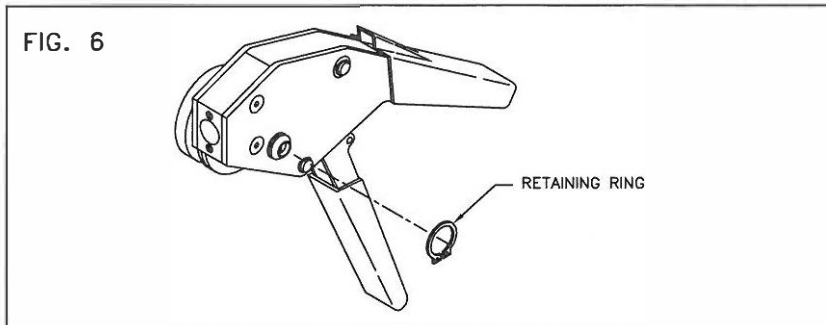
ADJUSTING CABLE TENSION WITH OPTIONAL KNURLED ADJUSTMENT SCREW P/N SCT32083

- 1.4.2 Figure 5A shows the optional knurled tension adjustment screw. This option allows the cable tension adjustment to be performed without the use of a 1/4" straight edge screwdriver.

1.5 TENSIONING WHEEL LOCATION

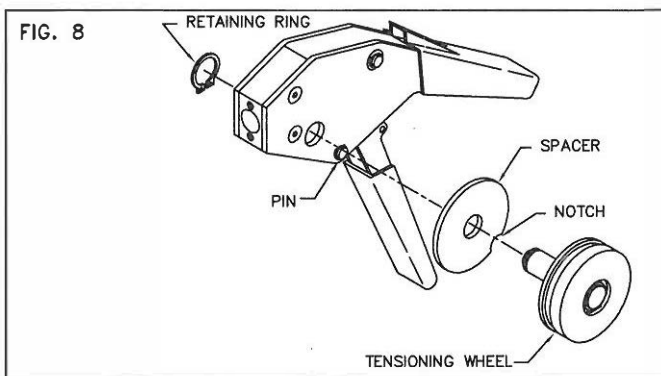
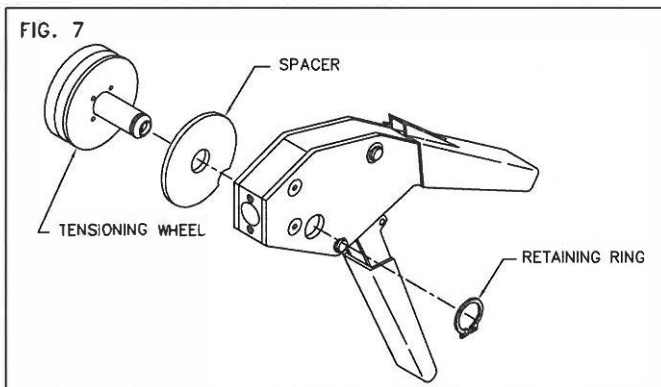
1.5.1 The tensioning wheel can be mounted on either the left or right side of the tool.

1.5.2 To remove the tensioning wheel, remove the retaining ring shown in Fig 6 using Daniels SCTD012 retaining ring pliers or equivalent. Do not remove the retaining ring on the tension wheel.



1.5.3 Slide the tensioning wheel and spacer from the tool (see Fig 7)

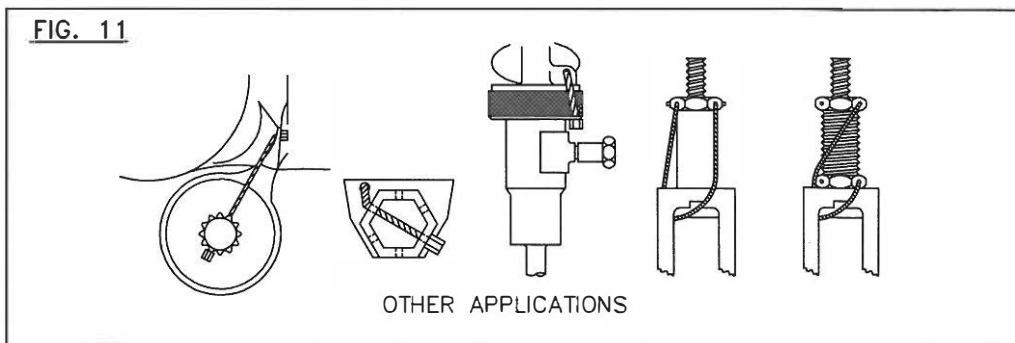
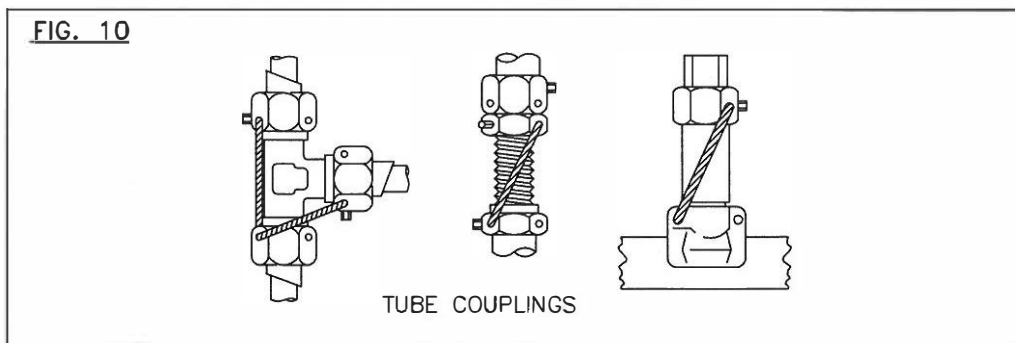
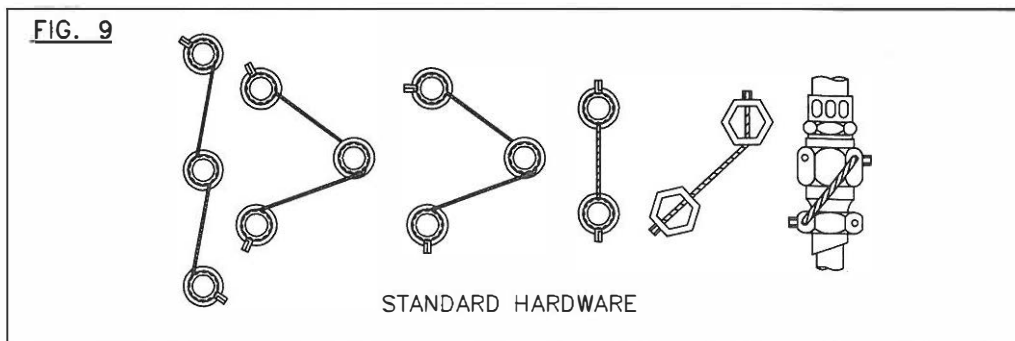
1.5.4 Install the tensioning wheel and spacer on the opposite side of the tool. Align the notch in the spacer with the pin in the tool body (see Fig 8)



1.5.5 Reinstall the retaining ring.

2.0 PROPER CABLE INSTALLATION

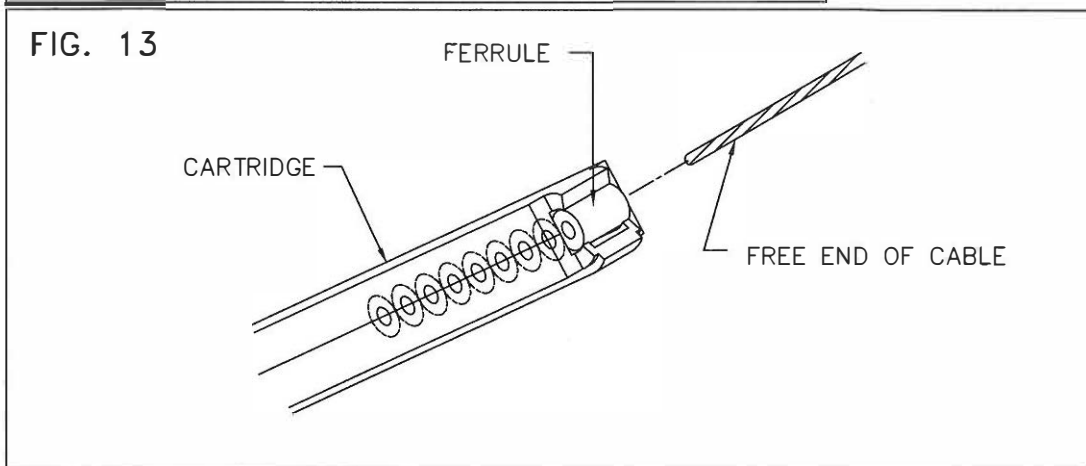
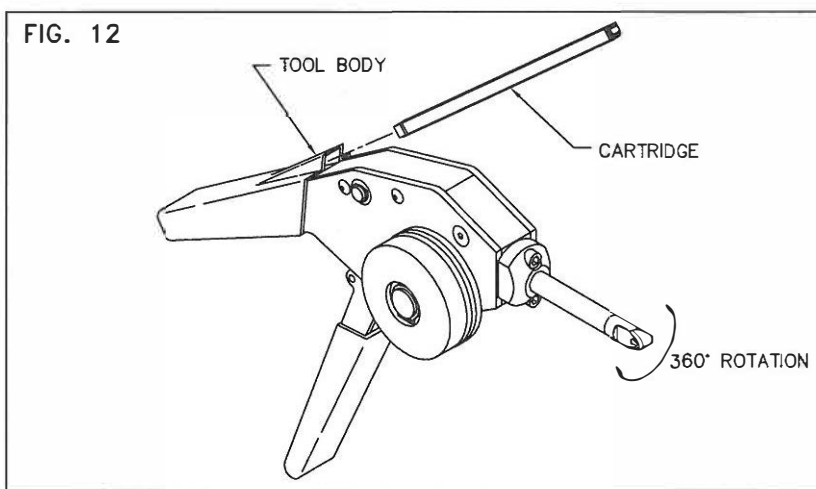
- 2.1 Various examples of Safe-T-Cable[®] installation are shown in Figs. 9 thru 11. Although all possible combinations are not shown, three basic rules apply.
- It is recommended that Safe-T-Cable[®] be installed in such a manner that any tendency for a fastener to loosen will be counteracted by an additional tension on the cable. Sharp turns in excess of 135° should be avoided. Installed Safe-T-Cable[®] should produce a positive or neutral pull on the fastener.
 - Safe-T-Cable[®] should be installed in two or three bolt patterns. Two bolt patterns being preferred when Safe-T-Cable[®] is applied to an even number of fasteners.
 - Maximum span of Safe-T-Cable[®] shall be six inches from end to end.



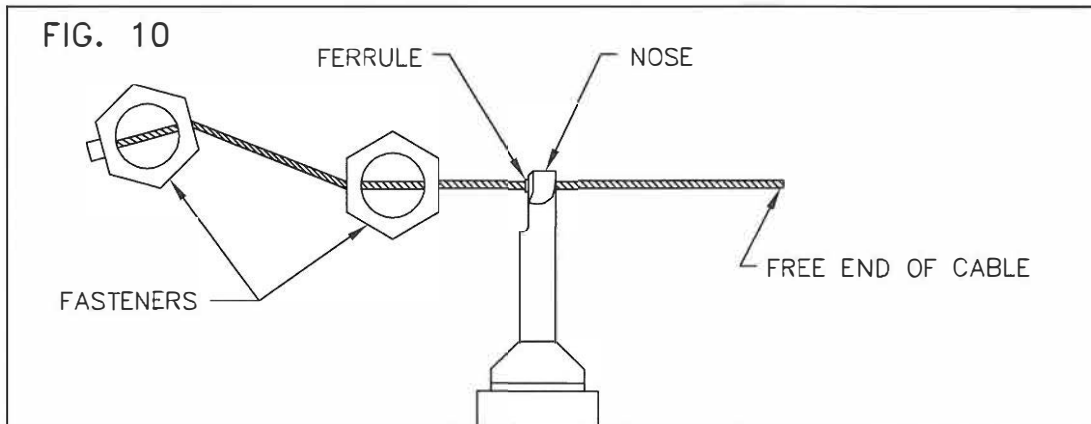
3.0 PROPER LOADING AND USE OF THE APPLICATION TOOL

- 3.1 Select the proper Safe-T-Cable[®] kit (see section 5.0).
- 3.2 Install the cartridge supplied with the Safe-T-Cable[®] kit into the tool body as shown in Fig. 8.
- 3.3 Install the Safe-T-Cable[®] through the fasteners as described in section 2.0.
- 3.4 The nose of the tool can be rotated to any position (see Fig. 12). Rotate the nose to the desired position.
- 3.5 Insert the free end of the cable through the last ferrule in the cartridge as shown in Fig. 9. Remove the ferrule by pulling the cable away from the end of the cartridge.

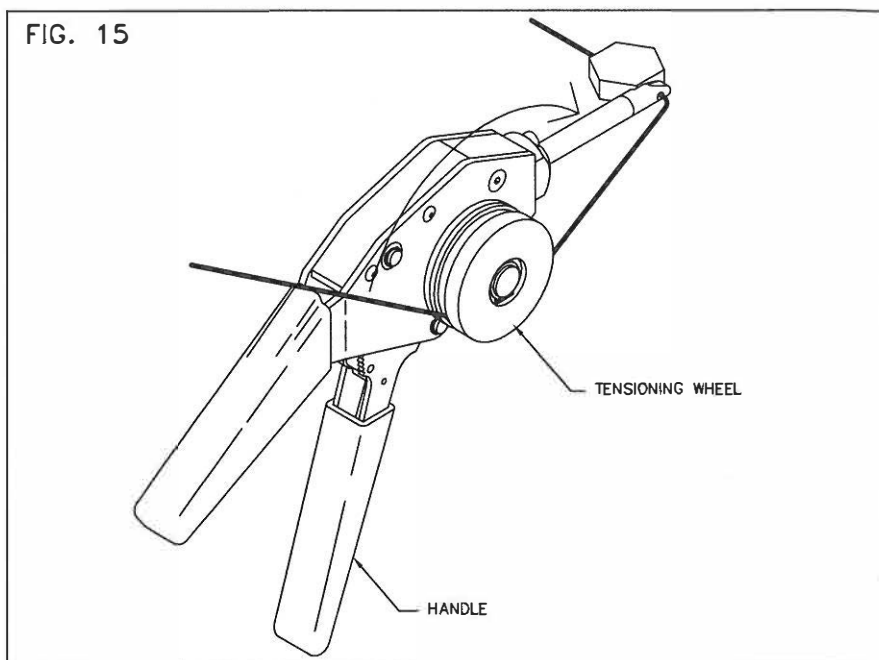
CAUTION: DO NOT RELEASE THE FREE END OF THE CABLE UNTIL IT HAS BEEN INSERTED THROUGH THE NOSE.



- 3.6 Insert the free end of the cable through the nose as shown in Fig. 14. Slide the tool along the cable to the desired position. Make certain that the ferrule is fully seated in the nose.



- 3.7 Wrap the cable into the tensioning wheel clockwise as shown in Fig 15. Wrap the cable one full revolution around the tensioning wheel making sure the cable is held in place by the wheel. Tension the cable by rotating the tensioning wheel until several distinct clicks are heard and felt. The clicks indicate that proper tension has been achieved.
- 3.8 Completely close the handles to crimp and cut the cable. Hold the tool nose steady and perpendicular to the fastener to maintain consistent cable tension.

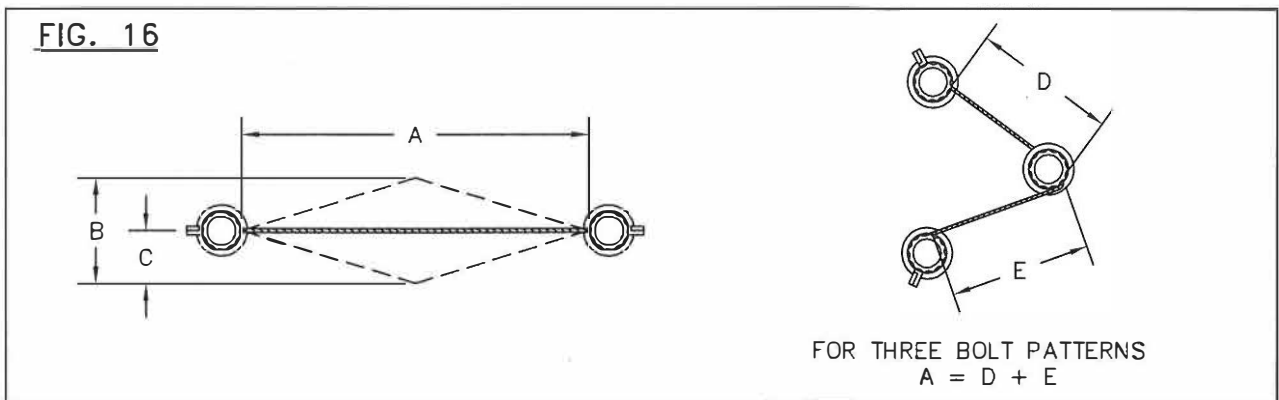


- 3.9 After crimping and cutting, release the handle and slide the tool off the crimped ferrule. Remove the excess cable from the tool by grasping the cut end and unwinding in the opposite direction of the installation. Dispose of properly.

4.0 VERIFICATION OF INSTALLATION

- 4.1 Verify proper tension of the cable. Refer to Table 1, Fig. 16 for Safe-T-Cable[®] flex limits.
- 4.2 Verify that the cable was installed through the fasteners in accordance with Section 2.0
- 4.3 Verify that the cable was cut flush at the end of the ferrule with no strand extending more than 1/32 inch from the end of the ferrule.
- 4.4 Visually inspect the cable for any nicks or other damage that may have occurred during installation.

TABLE 1 FLEX LIMITS, DIMENSIONS		
A IN. (mm)	B IN. (mm)	C IN. (mm)
0.5 (12.7)	0.125 (3.18)	0.062 (1.59)
1.0 (25.4)	0.250 (6.35)	0.125 (3.18)
2.0 (50.8)	0.375 (9.52)	0.188 (4.76)
3.0 (76.2)	0.375 (9.52)	0.188 (4.76)
4.0 (101.6)	0.500 (12.70)	0.250 (6.35)
5.0 (127.0)	0.500 (12.70)	0.250 (6.35)
6.0 (152.4)	0.625 (15.88)	0.312 (7.94)



5.0 SAFE-T-CABLE[®] SYSTEM PART NUMBERS

5.1 Tool/Accessory part numbers

APPLICATION TOOLS (COMPLETE)		
TOOL PART NUMBER	NOMINAL CABLE DIAMETER	NOSE LENGTH
SCTR203	.022	3 IN.
SCTR207	.022	7 IN.
SCTR323	.032	3 IN.
SCTR327	.032	7 IN.
SCTR403	.040	3 IN.
SCTR407	.040	7 IN.

INTERCHANGEABLE NOSES*		
NOSE PART NUMBER	NOMINAL CABLE DIAMETER	NOSE LENGTH
SCTN20-3	.022	3 IN.
SCTN20-7	.022	7 IN.
SCTN32-3	.032	3 IN.
SCTN32-7	.032	7 IN.
SCTN40-3	.040	3 IN.
SCTN40-7	.040	7 IN.

* All lengths of noses are interchangeable using the same basic (cable diameter) tool.

CAUTION: INDENTER CALIBRATION MUST BE CHECKED WHENEVER THE NOSE IS CHANGED (SEE SECTION 1.1).

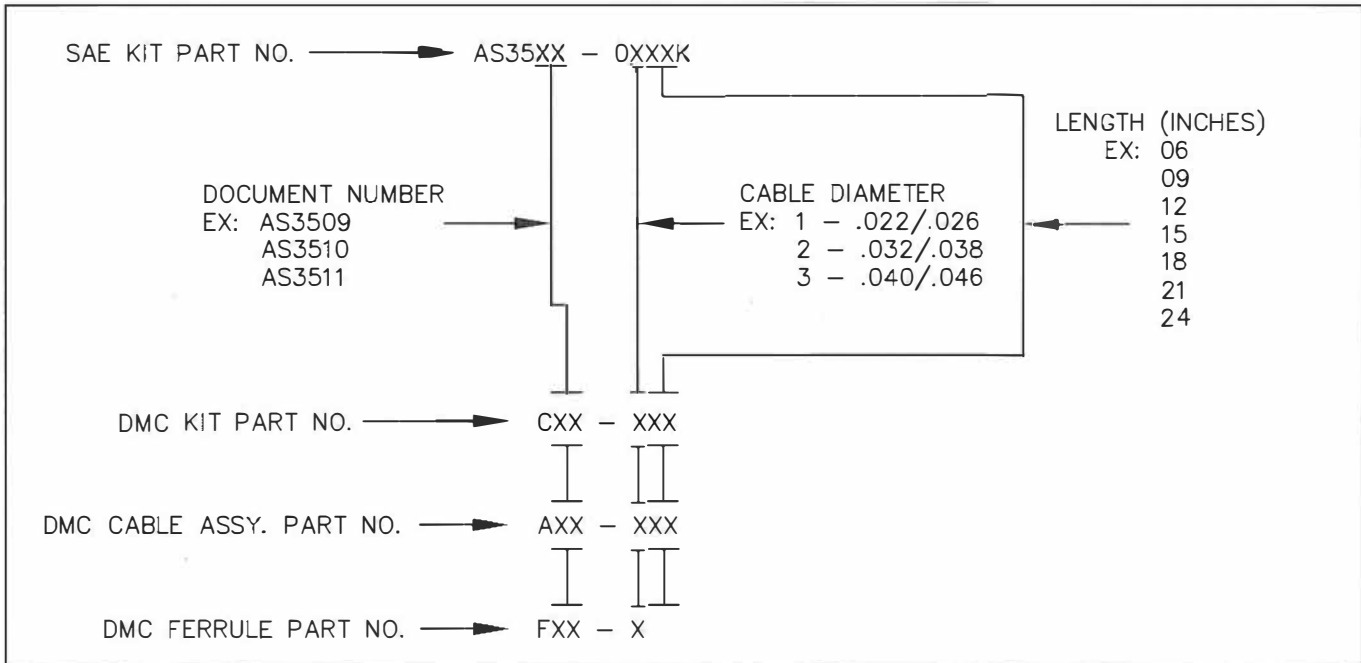
PNEUMATIC APPLICATION TOOLS		
TOOL PART NUMBER	NOMINAL CABLE DIAMETER	NOSE LENGTH
SCTP203	.022	3 IN.
SCTP207	.022	7 IN.
SCTP323	.032	3 IN.
SCTP327	.032	7 IN.
SCTP403	.040	3 IN.

ELECTRIC APPLICATION TOOLS		
TOOL PART NUMBER	NOMINAL CABLE DIAMETER	NOSE LENGTH
SCTE203B	.022	3 IN.
SCTE207B	.022	7 IN.
SCTE323B	.032	3 IN.
SCTE327B	.032	7 IN.
SCTE403B	.040	3 IN.

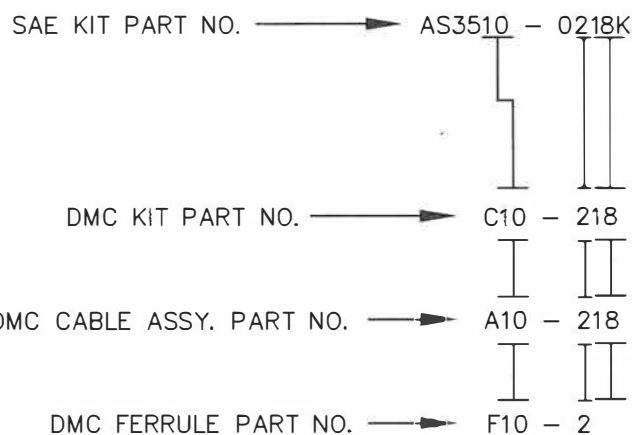
OTHER SAFE-T-CABLE [®] APPLICATION TOOLS	
SCT SERIES	PRESET TENSION TOOL
SCTH SERIES	HYDRAULIC ADJUSTABLE TENSION TOOL

ACCESSORY PART NUMBERS	
PART NUMBER	DESCRIPTION
SCT-TB1	TEST BLOCK
SCTD0001	TORQUE WRENCH (20-150 IN-LB)
45-6N	DIAGONAL CUTTERS
MPT-250B-SC	MOTORIZED TENSILE TESTER
SCTD012	RETAINING RING PLIERS
SCTD013	RETENTION TESTER
SCTD0006	NEEDLE NOSE PLIERS

5.2 SAE TO DMC SAFE-T-CABLE[®] PART NUMBER CROSS REFERENCE



EXAMPLE PART NUMBER: A KIT CONFORMING TO SAE AS3510
.032/.038 CABLE DIAMETER
18 INCHES IN LENGTH



5.3 DANIELS SAFE-T-CABLE® KIT PART NUMBERS

TABLE 2 .020, .032, .040 NOMINAL DIAMETER CABLE KITS				
KIT PART NUMBER	CABLE DIAMETER IN.	COMPONENT MATERIAL	LENGTH IN. (mm)	MINIMUM PULL-OFF LOAD LB. (N)
C10-106	.022/.026 [1 X 7 STRAND]	UNS S32100 CORROSION AND HEAT RESISTANT ALLOY (AMS5689)	6 (152)	30 (133.4)
C10-109			9 (229)	
C10-112			12 (305)	
C10-115			15 (381)	
C10-118			18 (457)	
C10-121			21 (533)	
C10-124			24 (610)	
C10-206	.032/.038 [3 X 7 CABLE]	UNS S32100 CORROSION AND HEAT RESISTANT ALLOY (AMS5689)	6 (152)	70 (311.4)
C10-209			9 (229)	
C10-212			12 (305)	
C10-215			15 (381)	
C10-218			18 (457)	
C10-221			21 (533)	
C10-224			24 (610)	
C10-306	.040/.046 [7 X 7 CABLE]	UNS S32100 CORROSION AND HEAT RESISTANT ALLOY (AMS5689)	6 (152)	110 (489.3)
C10-309			9 (229)	
C10-312			12 (305)	
C10-315			15 (381)	
C10-318			18 (457)	
C10-321			21 (533)	
C10-324			24 (610)	

A Safe-T-Cable® kit includes cable with an end fitting attached and a ferrule. Kits are sold and packaged in groups of 50. Consult the factory for information on INCONEL® Safe-T-Cable® kits.

5.4 DANIELS SAFE-T-CABLE® FERRULE PART NUMBERS

TABLE 3 FERRULES		
FERRULE PART NUMBER	FOR NOMINAL CABLE DIAMETER	MATERIAL
F10-1	.022	UNS S32100
F10-2	.032	UNS S32100
F10-3	.040	UNS S32100

TABLE 4 ELONGATED FERRULES FOR LOW PROFILE APPLICATIONS		
FERRULE PART NUMBER	FOR NOMINAL CABLE DIAMETER	MATERIAL
F10-08	.022	UNS S32100
F10-04	.032	UNS S32100
F10-07	.040	UNS S32100

Daniels Safe-T-Cable[®] ferrules are sold in groups of 50 and are packaged in a cartridge. Consult the factory for information concerning low profile installations.

5.5 DANIELS SAFE-T-CABLE[®] ASSEMBLY PART NUMBERS

TABLE 5 .020, .032, .040 NOMINAL DIAMETER CABLE ASSEMBLIES				
ASSEMBLY PART NUMBER	CABLE DIAMETER IN.	COMPONENT MATERIAL	LENGTH IN. (mm)	MINIMUM PULL-OFF LOAD LB. (N)
A10-106	.022/.026 [1 X 7 STRAND]	UNS S32100 CORROSION AND HEAT RESISTANT ALLOY (AMS5689)	6 (152)	30 (133.4)
A10-109			9 (229)	
A10-112			12 (305)	
A10-115			15 (381)	
A10-118			18 (457)	
A10-121			21 (533)	
A10-124			24 (610)	
A10-206	.032/.038 [3 X 7 CABLE]	UNS S32100 CORROSION AND HEAT RESISTANT ALLOY (AMS5689)	6 (152)	70 (311.4)
A10-209			9 (229)	
A10-212			12 (305)	
A10-215			15 (381)	
A10-218			18 (457)	
A10-221			21 (533)	
A10-224			24 (610)	
A10-306	.040/.046 [7 X 7 CABLE]	UNS S32100 CORROSION AND HEAT RESISTANT ALLOY (AMS5689)	6 (152)	110 (489.3)
A10-309			9 (229)	
A10-312			12 (305)	
A10-315			15 (381)	
A10-318			18 (457)	
A10-321			21 (533)	
A10-324			24 (610)	

A Safe-T-Cable[®] assembly includes cable with an end fitting attached. Assemblies are sold and packaged in groups of 50.

Consult the factory for information on INCONEL[®] and 304 stainless steel Safe-T-Cable[®] assemblies.

DMC offers complete refurbishing and recalibration services.

DMC specially engineers and manufactures complete tool kits to satisfy individual customer requirements, such as total aircraft support, general shop maintenance or production, on board ship and vehicle service, etc.

INVALIDATION OF LIMITED WARRANTY

THIS MANUAL IS PROVIDED TO THOSE OWNERS OF DANIELS MANUFACTURING CORPORATION (DMC) PRODUCTS WHO HAVE ELECTED TO CONDUCT IN-HOUSE REPAIRS OF SUCH PRODUCTS AND WHO THEREBY CONSENT TO WAIVE ANY RIGHTS WHICH THEY OTHERWISE MIGHT HAVE HAD UNDER THE DMC LIMITED WARRANTY APPLICABLE TO SUCH PRODUCTS.

DMC PROVIDES COMPLETE REPAIR AND MAINTENANCE SERVICE FOR ALL OF ITS PRODUCTS. OWNERS OF DMC PRODUCTS ARE WARNED THAT ANY TAMPERING, INCLUDING PARTIAL OR COMPLETE DISASSEMBLY OF THE PRODUCT OR ATTEMPTED REPAIRS OF THE PRODUCT WILL INVALIDATE THE LIMITED WARRANTY APPLICABLE TO SAID PRODUCT.

LIMITATION OF LIABILITY

DANIELS MANUFACTURING CORPORATION IS NOT LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY NATURE OR KIND RESULTING FROM THE USE, OR MISUSE, OF ANY OF ITS PRODUCTS. OWNERS AND USERS OF DMC PRODUCTS ASSUME FULL RESPONSIBILITY FOR INSTRUCTING THEIR EMPLOYEES IN THE PROPER AND SAFE USE OF SUCH PRODUCTS.

LIMITED WARRANTY

DMC (Daniels Manufacturing Corporation) warrants each new product sold by it to be free from defects in material and workmanship under normal use and service. DMC's obligation under this warranty is limited to the free correction or, at DMC's option, the refund of the purchase price of any such product which proves defective in normal service within ninety (90) days after delivery to the first user, provided that the product is returned to DMC with all transportation charges prepaid and which shall appear to DMC's satisfaction, after DMC's inspection, to have been defective in material or workmanship, it being understood that DMC products are not consumer products. This warranty shall not cover any damage to any product which, in the opinion of DMC, was caused by normal wear, misuse, improper operation, tampering, neglect or accident. This warranty is in lieu of all other warranties express or implied. No warranty, express or implied, is made or authorized to be made or assumed with respect to products of Daniels Manufacturing Corporation other than those herein set forth.