



M85049/128 EMI/RFI Shield Band Tooling Guide

An ISO9001 & AS9100
Registered Company

DMC DANIELS
MANUFACTURING
CORPORATION

EMI/RFI Band Application System for M85049/128 Shield Termination Bands



EMI/RFI Band Application System

The termination of EMI/RFI shielding materials is a specialized science in today's aerospace wiring systems. Application tooling is a critical factor in the overall performance of the wiring system components. DMC has worked closely with the world's leading connector accessory manufacturers and standards organizations to develop the necessary tooling and accessories to meet the stringent demands of aerospace and defense system contractors. The resulting products afford the user a repeatable and reliable means of terminating shielding on aerospace wiring systems. Tooling is available for all bands qualified to AS85049/128

M81306/1 SERIES ONE-STEP BANDING TOOL



DMC's One-Step Banding Tools are designated for M85049/128-3, M85049/128-4, M85049/128-7 and M85049/128-8 "stamped buckle" bands. These tools tension, bend, and cut the band in one operation.
(See page 8 for available tool and accessory combinations)

DBS-2100 is the .250 Wide Band Application Tool M81306/1A
DBS-2200 is the .125 Wide Mini-Band Application M81306/1B

One-Step Tool Application



Stamped Buckle Band (See page 2 for more info)

M81306/2 SERIES TWO-STEP BANDING



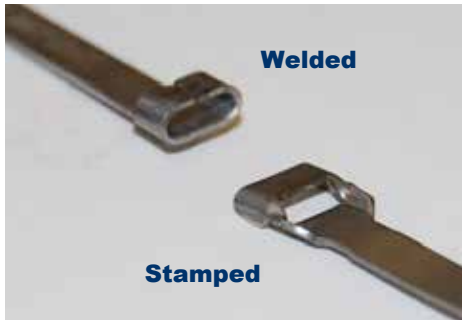
DMC's Two-Step Banding Tools are designated for M85049/128-1, M85049/128-2, M85049/128-5 and M85049/128-6 "welded buckle" bands. These tools tension and cut the band and leave an extended cut off tab. The second step provides an extra level of security by utilizing a roll-over tool to bend the cut-off tab over a full 180 degrees in a second operation.
(See page 7 for available tool and accessory combinations)

DBS-1100 is the .250 Wide Band Application Tool M81306/2-01A
DBS-1200 is the .125 Wide Mini-Band Application Tool M81306/2-02B

Two-Step Tool Application



M85049/128 Band Configurations



M85049/128 Shield Termination Bands are available in two distinct configurations, Stamped and Welded Buckles, and two different widths, .250 in. (6.350 mm) and .125 in. (3.175 mm). The bands come flat or pre-coiled and ready for use.

The buckle for the M85049/128-3, M85049/128-4, M85049/128-7, and M85049/128-8 bands is a STAMPED buckle. This configuration is low-profile style with a slot for the other end of the band to pass through.

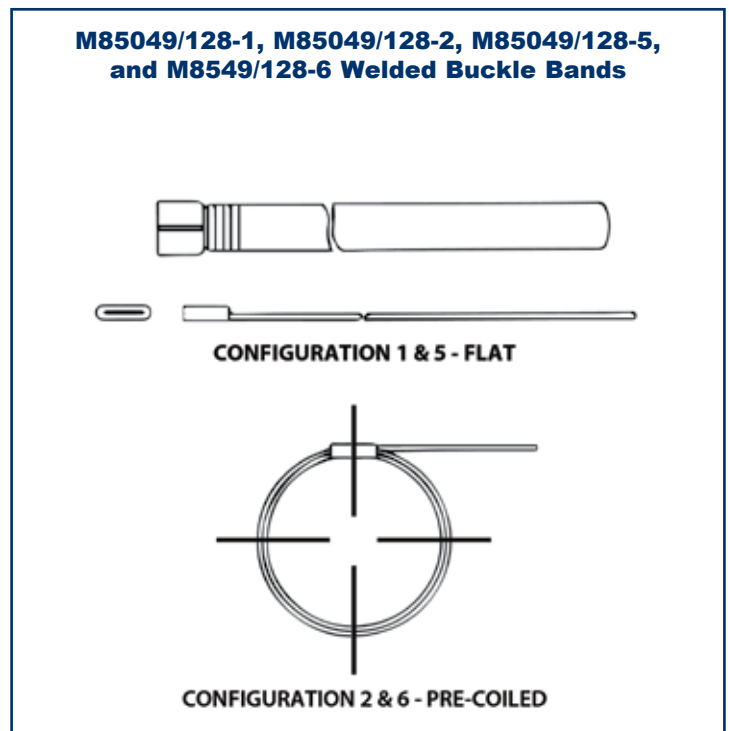
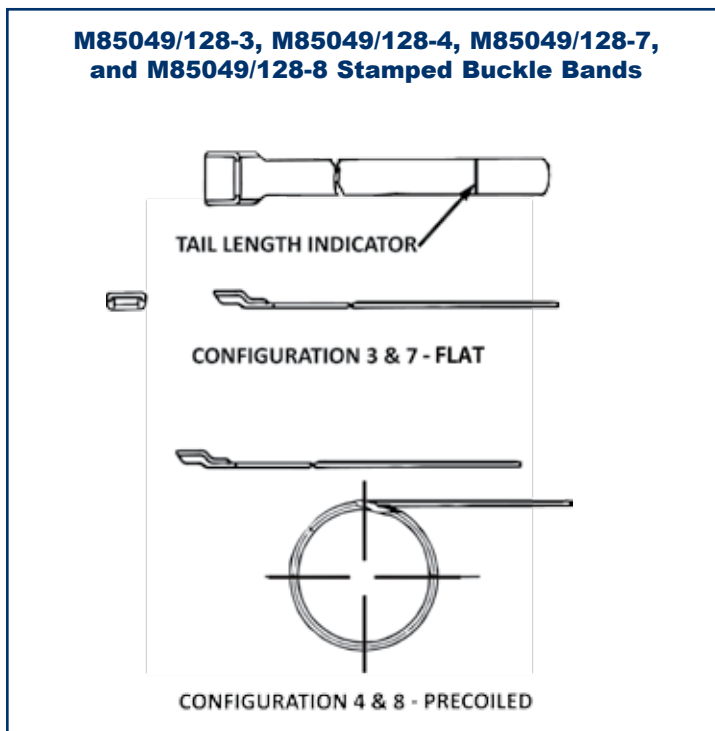
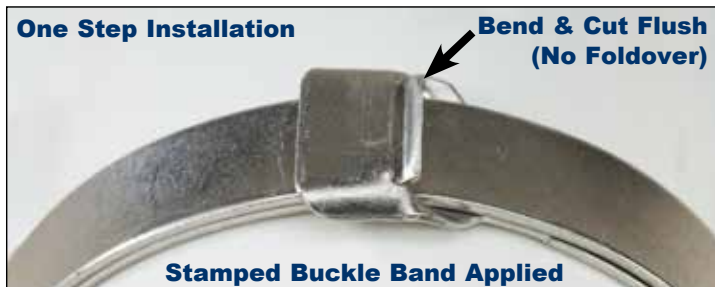
The buckle for the M85049/128-1, M85049/128-2, M8549/128-5, and M85049/128-6 bands is a WELDED buckle. This configuration is folded style with a loop for the other end of the band to pass through.



NOTE: Always install M85049/128-X bands with 2 layers of band through the buckle.

Quick Reference Band Part Number Installation to Tool Table			
M85049/128-1	2 STEP TOOL	M85049/128-5	2 STEP TOOL
M85049/128-2	2 STEP TOOL	M85049/128-6	2 STEP TOOL
M85049/128-3	1 STEP TOOL	M85049/128-7	1 STEP TOOL
M85049/128-4	1 STEP TOOL	M85049/128-8	1 STEP TOOL

Please see page 7 for more information



One-Step Banding Tool System

for M85049/128-3, /128-4, /128-7, and /128-8 bands



DBS-2100 & DBS-2200 (M81306/1A & M81306/1B)

(Other Combinations of Tools and Accessories Available - See Page 6-8 for details)

ONE-STEP BAND APPLICATION TOOLS

The One-Step Band Application Tools are built to SAE AS81306/1 specifications and designed to install M85049/128-3, M85049/128-4, M85049/128-7, and M85049/128-8 "stamped buckle" bands. These tools are constructed to survive the demands of production and maintenance use, and remain precisely adjusted to provide a quality band termination.

The tension-lock system gives the operator a positive indication when the precise tension has been applied. The cut-off handle easily cuts, bends, and locks the shield band in one step.

DBS-2100 .250 Wide Band Application Tool M81306/1A:

- Size and Weight: 6.71" x 6.75" x .92", 1.02 lbs.
- Tension Range: 145–155 lbs.
- Cut-off blades are replaceable with Blade Replacement Kit: DBS-2100-BRK

DBS-2200 .125 Wide Mini-Band Application Tool M81306/1B:

- Size and Weight: 6.71" x 6.75" x .92", 1.02 lbs.
- Tension Range: 75–85 lbs.
- Cut-off blade is replaceable with Blade Replacement Kit: DBS-2200-BRK

VERIFICATION OF ONE-STEP EMI/RFI BAND TOOLS M81306/1C & M81306/1D



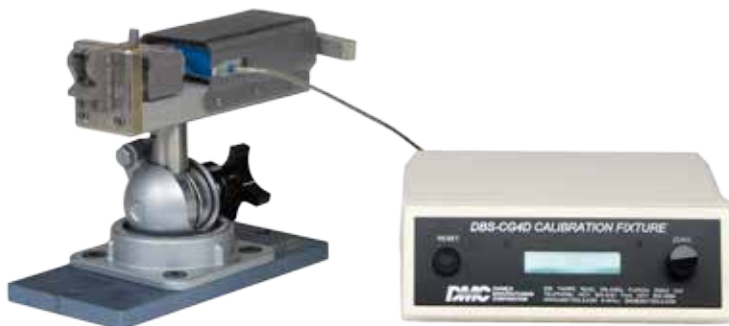
DBS-CG-7 (M81306/1C) for M81306/1A tool M81306/1D for M81306/1B tool
DBS-CG-8 (M81306/2D) DBS-2200
(Shown at rest with white line visible)

Field Verification Inspection Gages are available to check the tension of the DMC One-Step Band Tools. These gages have a precise compression mechanism which has a sequence of indicators to verify that the applied tension is within the specified range for the band which is being applied. It is recommended to check the tension periodically, and if it needs adjustment, the instructions and accessories are provided by DMC for that purpose. The .250 width band tool (DBS-2100 Series) requires the DBS-CG7 (M81306/1C) gage, and the .125 width band tool (DBS-2200 Series) requires the DBS-CG8 (M81306/1D) gage.

DMC also offers an Electronic Calibration Instrument for Calibration Laboratory operations. The Part Number DBS-CG4D Electronic Calibration Instrument will allow the operator to gage the exact tension produced by the tool, and therefore, one instrument can be used with either the .250 band width tool, or the .125 band width tool. This instrument is calibrated by DMC, and traceable to NIST.

Part Numbers and ordering information for the Field Verification Inspection Gages and the Electronic Calibration Instrument can be found in the part tables at the end of this catalog under One Step Application Tools, Accessories, and Components.

Use verification equipment in accordance with DMC instructions DBS-CG7-DS, DBS-CG8-DS or DBS-CG4D-DS.



DBS-CG4D (includes fixture with stand and digital readout meter)



Step 1: Prepare the Connector and Cable Braid

Prepare the connector and cable braid for band termination process (see back cover).

Step 2: Prepare Band

Using an appropriate size band, feed the end of the band through the narrow slot on the buckle twice. This will create a double-looped band. Never use a single-looped band. To hasten the termination process on smaller adapters, pull on the end of the band to reduce the diameter of the loop.

Step 3: Insert Looped Band into Tool

Squeeze the release lever and insert the end of the band into the nose of the tool. Ensure the orientation of the band matches the graphic on the body of the tool (coil down when the tool is held upright).



Step 6

Step 4: Positioning

Position the connector and the shield assembly through the band.

Step 5: Tighten Band around Braid/Connector

Repeatedly squeeze the tensioning handle until the band closes around the assembly. Once the band is closed around the assembly, use half strokes of the handle until the band is tight against the braided cable. Release the tensioning handle and allow it to open fully. With one final stroke, close the tensioning handle until it locks against the tool body. This indicates that the band has been tightened to the pre-set tension.



Step 7

Step 6: Cut Off

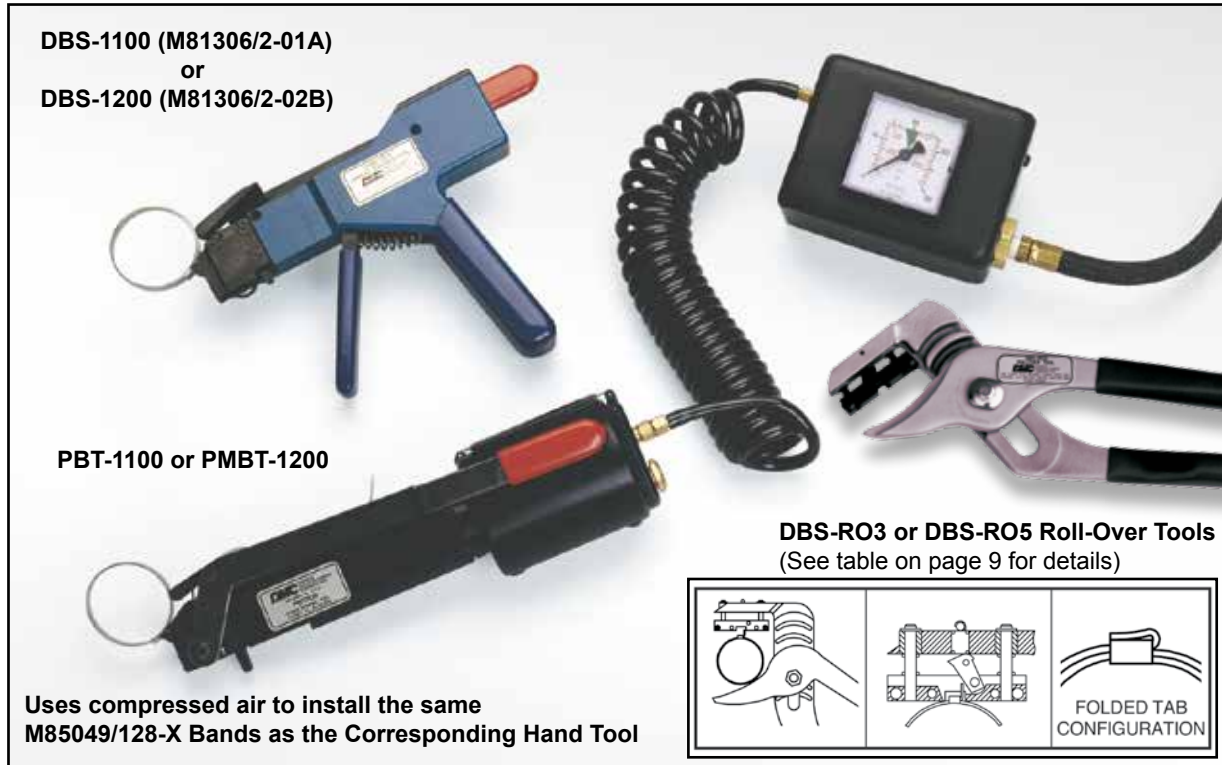
Once the tensioning handle is locked in place, squeeze the cut-off handle to finish the termination process. Both handles will open up on their own. (If shrinkable tubing is to be applied, it is recommended that the band is wrapped in tape and the excess braid folded back over the band to prevent cutting of shrinkable tubing).

Step 7: Remove Excess Band Material

Release the tensioning handle and then squeeze the release lever. While squeezing the release lever, carefully pull on the band and slide it out of the tool and discard.

Two-Step Banding Tools System

for M85049/128-1, /128-2, /128-5, and /128-6 bands



DBS-1100 AND DBS-1200 HAND OPERATED BANDING TOOLS

TWO STEP BAND APPLICATION TOOLS

DBS-1100 (M81306/2-01A) .250 Wide Band Tool:

- Size and Weight: 1.38" x 5.5" x 7.5", 1.4 lbs.
- Tension Range: 140–160 lbs.
- Cut-off blade: replaceable with DBS-1100-7

DBS-1200 (M81306/2-02B) .125 Wide Mini-Band Tool:

- Size and Weight: 1.38" x 5.5" x 7.5", 1.4 lbs.
- Tension Range: 70-90 lbs.
- Cut-off blade: replaceable with DBS-1100-7

DBS-R03 (M81306/2-01C) FOR .250 WIDE BANDS DBS-R05 (M81306/2-02D) FOR .125 WIDE BANDS

PBT1100 & PMBT1200 PNEUMATIC BAND APPLICATION TOOLS

The PBT1100 & PMBT1200 series Pneumatic Band Application Tools are lightweight, dependable, and easy to operate. Many of the components are interchangeable with the corresponding hand tool. DMC's Pneumatic Two-Step Banding Tools are compatible with all currently available bands to M85049/128.

PBT1100 .250 Wide Band Application Tool

- Size and Weight: 8.75" L, 1.52 lbs.
- Calibration Range: 140–160 lbs.

PMBT1200 .125 Wide Mini-Band Application Tool

- Size and Weight: 8.75" L x 1.52 lbs.
- Calibration Range: 70-90 lbs.

VERIFICATION OF TWO-STEP EMI/RFI BAND TOOLS

DMC's Two-Step Band Application Tools may be adjusted and verified to insure correct band tension. In order to make this operation simple and efficient for field use, DMC designed and patented a compression fixture system which uses a Go/No-Go Gage to measure the tool tension. Ordering information for the field verification equipment (Part Numbers DBS-CG2A and DBS-CG3A) can be found in the chart at the end of this catalog.

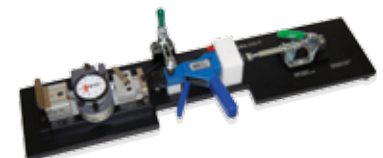


The DBS-CG1 Laboratory Calibration Instrument will allow the operator to measure the exact tension produced by the tool.

A free standing holding fixture is available (DBS-CG1-F) to aid the calibration process by securing the DBS-CG1 and banding tool in place. The DBS-CG1-F holding fixture secures the banding tool in place during calibration. This fixture only works with the Two-Step Tools and DBS-CG1 Calibration Instrument (Banding tools and DBS-CG1 are sold separately).



DBS-CG1



DBS-CG1-F

Two-Step Procedures

for M85049/128-1, /128-2, /128-5, and /128-6 bands



Step 1: Prepare the Connector and Cable Braid

Prepare the connector and cable braid for band termination process (See back cover).

Step 2: Prepare Band

Using an appropriate size band, feed the end of the band through the narrow slot on the buckle twice. This will create a double-looped band. Never use a single-looped band. Pull on the end of the band to reduce the diameter of the loop.

Step 3: Insert Looped Band into Tool

Insert the band into the banding tool at least 1.75 inches, the band loop should be orientated on the upper side of the tool's nose. Actuate the movable tensioning handle of the tool one complete stroke to insure that the band has been captured by the gripping mechanism.

Step 4: Positioning

Position the connector and the shield assembly through the band.

Step 5: Tighten Band around Braid/Connector

Actuate the movable tensioning handle of the tool until the band is snug and tool resistance is felt, then release the movable handle and actuate the handle one full stroke thus locking the movable handle (locking occurs at the pre-set tension).

Step 6: Bend and Cut Band

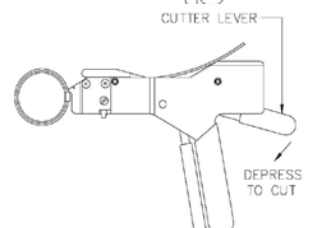
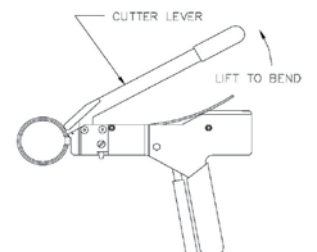
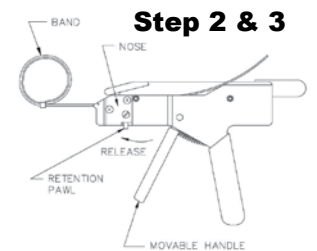
To complete the termination, the band must be bent 90° by lifting the cutter lever upwards, and cut by depressing the cutter lever downwards. Note: Sometimes the movable handle will open during the bend or cut operation. This is normal.

Step 7: Remove Excess Band Material

Remove excess band material from the tool by pulling out toward rear of tool.

Step 8: Roll Over Tab

The cutoff tab must be rolled over 180° in a manner which will prevent slippage. Use the Tab Roll-Over Tool to perform the rollover. NOTE: Slippage may occur if rollover exceeds 180°.



Step 6 - Bend & Cut

MILITARY PART NUMBER TO DMC PART NUMBER CHART

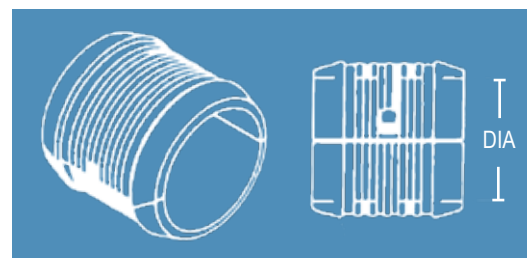
TOOL MIL P/N	DESCRIPTION	WIDTH	DMC P/N	APPLICATION
M81306/1-01	Set: One-Step Tool, Gage, and Tension Key	.250	DBS-2102	M85049/128-3 & -4
M81306/1-02	Set: One-Step Tool, Gage, and Tension Key	.125	DBS-2202	M85049/128-7 & -8
M81306/1A	One-Step Band Installation Tool	.250	DBS-2100	M85049/128-3 & -4
M81306/1B	One-Step Band Installation Tool	.125	DBS-2200	M85049/128-7 & -8
M81306/1C	Tension Verification Compression Fixture	.250	DBS-CG7	DBS-2100
M81306/1D	Tension Verification Compression Fixture	.125	DBS-CG8	DBS-2200
M81306/1E	Tension Adjustment Key	.125 & .250	DBS-2100-32	DBS-2100 & DBS-2200
M81306/2-01	Two-Step Installation Tool and Roll-Over Tool	.250	DBS-1101	M85049/128-1 & -2
M81306/2-02	Two-Step Installation Tool and Roll-Over Tool	.125	DBS-1201	M85049/128-5 & -6
M81306/2-01A	Two-Step Band Tool	.250	DBS-1100	M85049/128-1 & -2
M81306/2-02B	Two-Step Band Tool	.125	DBS-1200	M85049/128-5 & -6
M81306/2-01C	Roll Over Tool	.250	DBS-RO3	M85049/128-1 & -2
M81306/2-02D	Roll Over Tool	.125	DBS-RO5	M85049/128-5 & -6
M81306/2-01E	Tension Verification Gage & Compression Fixture	.250	DBS-CG2A	DBS-1100
M81306/2-02F	Tension Verification Gage & Compression Fixture	.125	DBS-CG3A	DBS-1200

AS85049/128 BAND IDENTIFICATION CHART AND BAND ACCESSORIES

BAND MIL P/N	CONFIGURATION	WIDTH	DMC P/N	TERMINATE WITH
M85049/128-1	Welded Buckle, Flat, .250 wide x 14.25" long	.250	DBS-128-1	Two-Step Only
M85049/128-2	Welded Buckle, Pre-Coiled, .250 wide x 14.25" long	.250	DBS-128-2	Two-Step Only
M85049/128-3	Stamped Buckle, Flat, .250 wide x 14.25" long	.250	DBS-128-3	One-Step Only
M85049/128-4	Stamped Buckle, Pre-Coiled, .250 wide x 14.25" long	.250	DBS-128-4	One-Step Only
M85049/128-5	Welded Buckle, Flat, .125 wide x 9" long	.125	DBS-128-5	Two-Step Only
M85049/128-6	Welded Buckle, Pre-Coiled, .125 wide x 9" long	.125	DBS-128-6	Two-Step Only
M85049/128-7	Stamped Buckle, Flat, .125 wide x 8.52" long	.125	DBS-128-7	One-Step Only
M85049/128-8	Stamped Buckle, Pre-Coiled, .125 wide x 8.52" long	.125	DBS-128-8	One-Step Only

SPLIT RING FOR MID-CABLE SHIELD TERMINATIONS

BAND MIL P/N	CONFIGURATION
(M85049/93-08)*	.500 Dia. Split Ring Set*
(M85049/93-12)*	.750 Dia. Split Ring Set*
(M85049/93-16)*	1.00 Dia. Split Ring Set *
(M85049/93-24)*	1.50 Dia. Split Ring Set*



*Other diameters available - consult DMC for details

ONE-STEP APPLICATION TOOLS, ACCESSORIES AND COMPONENTS

.250 STANDARD WIDTH BAND TOOLS

DBS-2100	M81306/1A Hand Operated Band Tool
DBS-2102	Hand Operated Band Tool Set (includes DBS-2100, DBS-2100-32 & DBS-CG7) (M81306/1-01)
DBS-2100-32	Tension Adjustment Key M81306/1E
DBS-2100-SB	Replacement Stationary Blade for .250 Band Tools (Reference Datasheet DBS-2100-BRK-DS)
DBS-2100-MB	Replacement Movable Blade for .250 Band Tools (DS DBS-2100-BRK-DS)

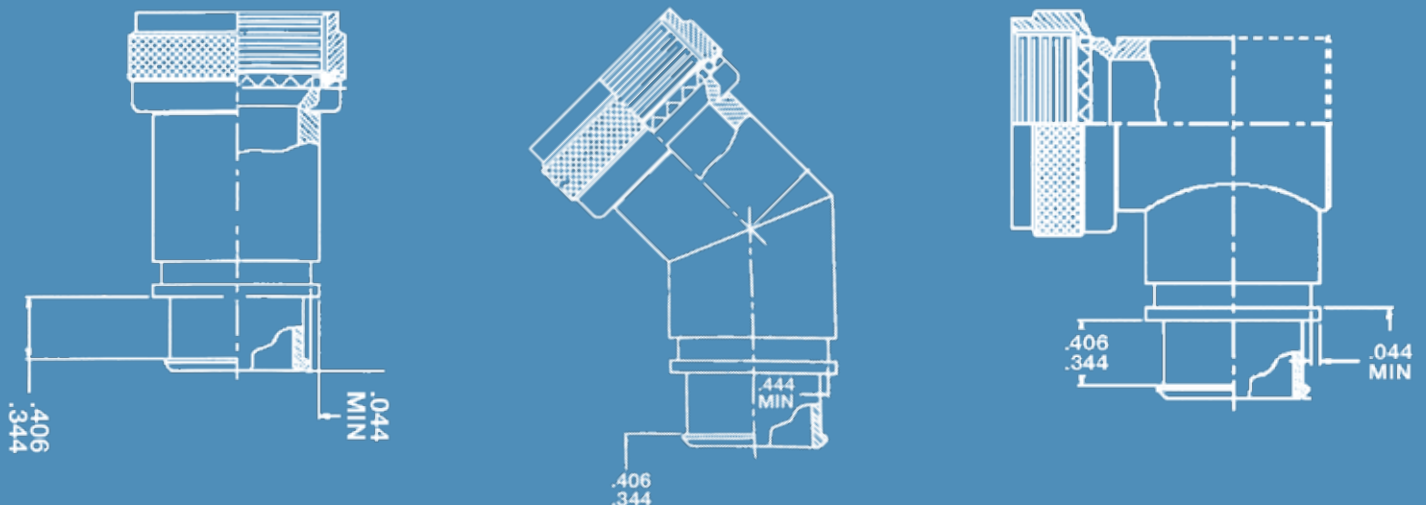
.125 WIDTH MINI-BAND TOOLS

DBS-2200	M81306/1B Hand Operated Mini Band Tool
DBS-2202	Hand Operated Mini Band Tool Set (DBS-2200, DBS-2100-32, DBS-CG8) (M81306/1-02)
DBS-2100-32	Tension Adjustment Key (M81306/1E)
DBS-2200-SB	Replacement Stationary Blade for .125 Band Tools (Reference Datasheet DBS-2200-BRK-DS)
DBS-2200-MB	Replacement Movable Blade for .125 Band Tools (NOTE: Not field replaceable, contact factory)

TOOL VERIFICATION INSTRUMENTATION

DBS-CG4D	Laboratory Verification Instrument (Electronic) for DBS-2100 & DBS-2200 series band tools
DBS-CG7	Field Verification Inspection Gage for DBS-2100, M81306/1C
DBS-CG8	Field Verification Inspection Gage for DBS-2200, M81306/1D

Typical Shield Band/Backshell Application



TWO-STEP APPLICATION TOOLS, ACCESSORIES AND COMPONENTS

.250 STANDARD WIDTH BAND TOOLS

DBS-1100	M81306/2-01A Hand Operated Band Tool (Only)
DBS-1101	Hand Operated Band Application Tool Set M81306/2-01 (includes DBS-1100, DBS-RO3)
DBS-1102	Hand Operated Band Application Tool Set (includes DBS-1100, DBS-RO3, DBS-CG2 & G691)
DBS-1100-32	Tension Adjustment Key
DBS-1100-7	Replacement Blade for .250 Band Tools
DBS-RO3	Roll-Over Tool for .250 Band Tab, M81306/2-01C

.125 WIDTH MINI-BAND TOOLS

DBS-1200	M81306/2-02B Hand Operated Mini Band Tool
DBS-1201	Hand Operated Mini Band Application Tool Set M81306/2-02 (includes DBS-1200, DBS-RO5)
DBS-1202	Hand Operated Mini Band Application Tool Set (includes DBS-1200, DBS-RO5, DBS-CG3 & G752)
DBS-1100-7	Replacement Blade for .125 Band Tools
DBS-RO5	Roll-Over Tool for .125 Band Tab, M81036/2-02D

PNEUMATIC BAND TOOLS FOR .250 WIDTH BANDS (WELDED BUCKLE BANDS ONLY)

PBT1100	Two-Step Pneumatic Band Application Tool
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PNEUMATIC BAND TOOLS FOR .125 WIDTH BANDS (WELDED BUCKLE BANDS ONLY)

PMBT1200	Two-Step Pneumatic Band Application Tool
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TOOL VERIFICATION INSTRUMENTATION

DBS-CG1	Laboratory Verification Instrument for DBS-1100 & DBS-1200 series band tools
DBS-CG1-F	DBS-CG1 Holding Fixture (Banding tool & DBS-CG1 optional)
DBS-CG2	Field Verification Fixture for DBS-1100
G691	Go/No-Go Gage for DBS-CG2 Fixture
DBS-CG2A	M81306/2-01E Verification Set which includes DBS-CG2 & G691
DBS-CG3	Field Verification Fixture for DBS-1200
G752	Go/No-Go Gage for DBS-CG3 Fixture
DBS-CG3A	M81306/2-02F Verification Set which includes DBS-CG3 & G752

BANDING APPLICATION KIT

DMC60A	.250 Banding Tool Kit with bands and sheilding components*
DMC1379	.250 Banding Tool Kit without cutters and sheilding components*

See page 10 for tool kit contents list.

DMC SHIELD BAND INSTALLATION KITS

The DMC2058A One-Step Band Installation Kit

The DMC2058A is an all inclusive One-step Band Installation Kit. It provides your service technicians with both the DBS-2100 (M81306/1A) .250" Wide Band Application Tool and the DBS-2200 (M81306/1B) .125" Wide Mini-Band Application Tool, along with stamped buckle bands, and all accessories needed to terminate bands.

Also included are all calibration, support accessories, and illustrated operating instructions for all the tooling included.



DMC2058A Contents

DBS-2102 (M81306/1-01)

DBS-2202 (M81306/1-02)

M85049/128-3 (10 PCS)

M85049/128-7 (10 PCS)

The DMC2058A Kit is equipped to install all M85049/128-3,-4 (.250 Wide) and M85049/128-7, -8 (.125 Wide) stamped EMI/RFI shield bands.

See page 8 for other tool combinations available from DMC.

DMC2058A One-Step Banding Tool Kit



DMC60A Two-Step Banding Tool Kit

The DMC Two-Step Band Installation Kit

If your process calls for the welded buckle shield bands, the Two- Step Band Installation Kit will provide all tools and accessories to support the assembly or maintenance of your wiring system.

Also included are all calibration, support accessories, and illustrated operating instructions for all the tooling included.

The DMC60A Kit is equipped to install all M85049/128-1, -2 (.250 Wide) welded EMI/RFI shield bands. The DMC 1379 similar to the DMC60A, but without cutters and shielding (includes all two step tools for .250 wide welded buckle bands).

Tool Kit is supplied in 1 fiberglass case and includes : Name Plate, Foam Pads/Inserts, Contents and Instruction Sheets. Other installation kits available with different capabilities. Contact DMC for details.

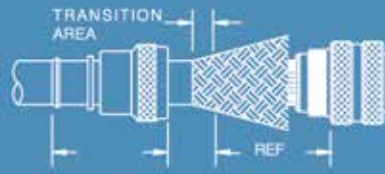
DMC60A Contents

Quantity	Part #	Description
1	DBS-1100 (M81306/2-01A)	Hand Operated Band Application Tool - 1/4"
1	DBS-BR1	Band Removal Tool
1	DBS-RO3 (M81306/2-01C)	Roll-Over Tool for .250 Band Tab
1	DBS-GG2	Field Calibration Fixture for DBS-1100
1	G691	Go/No-Go Gage for DBS-CG2 Fixture
100	M85049/128-2	.250 wide x 14.0" long EMI/RFI Band (coiled)*
1	MISC.	Tape, Braided Shielding, & Split Rings, & Hex Wrenches, Shears, Spare Cutter blades

EMI/RFI BAND APPLICATION SYSTEM FOR .125 & .250 SHIELD TERMINATION BANDS



Careful measurement should be made prior to installing the backshell. The outer jacket is then uniformly removed at a distance which would allow the braid to make a comfortable transition onto the backshell termination area. This dimension will vary depending upon the differences between cable and backshell diameters or other application dependent factors.



The braid is then trimmed to a length which will allow it to extend 1 inch past the backshell termination platform. Then the braid is carefully folded rearward to expose the



wires which will be inside the backshell.

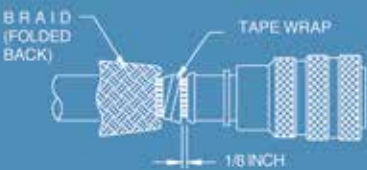
A sufficient number of wraps of self-vulcanizing tape (normally red in color) are applied over the wires to

build up a diameter slightly less than the inside diameter of the backshell. Care should be taken not to apply tension to the contacts located in the outer perimeter of the connector.

These layers of tape are followed by a minimum of one layer of Teflon tape which will prevent adhesion with the backshell and other components.



The backshell is then installed onto the connector, using a nonabrasive tool such as a



strap wrench. The braid is then carefully moved from under the backshell. It is important to retain the woven characteristics of the braid during this step.

Use self-vulcanizing tape or a preformed component to build up the area behind the backshell. It is important that the braid is supported in the transition from the backshell rear diameter to the natural diameter of the wire bundle. Leave approximately 1/8 inch spacing between the tape wrap and the backshell.

The braid is pushed into position over the backshell termination platform. Care must be taken to make sure the weave is uniform and no large "windows" are present.



A shield termination band is then loaded into the tool. The band is then slid over the connector/

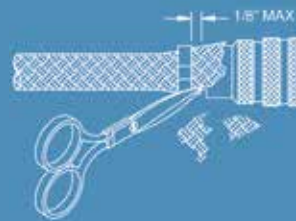
backshell assembly into a position of alignment with the termination platform. Apply an adequate amount of pressure in line with the cable as it enters the backshell to allow the 1/8 inch space to be reduced to zero.

The tool is then activated to the preset tension. The band is then bent sharply at the buckle approximately 90° then cut-off using the cut-off lever on the tool (applies to two-step only). If the band is uncurled for any reason, it must be double looped through the buckle before termination.



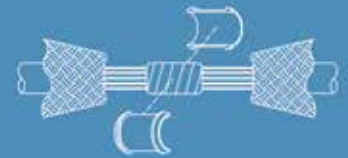
The 90° tab is then curled and folded back over the buckle using the rollover tool (applies to two-step only).

For braiding a non-jacket cable use fine point shears to trim the excess braid as close to the connector side of the bands as possible. Do not leave any unsecured braid wires longer than 1/8 inch. Do not allow the trimmed wires to fall in any areas where they may present a foreign object damage hazard.



PROCEDURE FOR SPLICING

The jacket is present, and shield has been cut and separated to expose the wires requiring service. Care must be taken to avoid damaging the insulation on internal wires. The required service is then completed.



The wire bundle is then protected by a few wraps of self-vulcanizing tape followed by 2-3 layers of teflon tape. An appropriate size splitting ring set is then selected and installed. One layer of teflon tape is applied over the split ring set to hold the halves in position while the next steps are being performed.



The braid is then overlapped across the split ring set. Be sure the braid ends protrude completely under the band in both directions.

Heat-shrinkable tape is then applied over the splice. When a jacketed cable is used, be sure the tape extends onto the jacket in both directions.



*NOTE: 2 Step Tool shown. These instructions are general and apply to One Step and Two Step tools. If these instructions conflict with engineering processes, the latter shall apply.