MAC Panel Company

DAK Assembly Instructions

Flex Circuit Style

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Assembling a DAK onto a PXI instrument - overview

Each MAC Panel DAK (Direct Access Kit) is designed to work with a range of PXI instruments.

Before commencing assembly ensure that you have the correct DAK for your instrument. If you are uncertain, please refer to the DAK Selector tool on the MAC Panel website https://www.macpanel.com/dak_selector/

To complete this assembly process, you will require the following:

- PXI Instrument
- DAK to suit the specific instrument
- DAK tool kit, MAC Panel part number 561211 https://www.macpanel.com/product/561211/
    - The tool kit contains all tools to ensure satisfactory assembly

Figure 1 DAK Tool Kit

The images in these instructions are taken from an assembly video that can be found at https://youtu.be/fzj9vyc4muU

It is highly recommended that you view this video in conjunction with these written instructions

Step 1 Remove Ejector Handle from PXI Instrument

To ensure that the PXI instrument is suitable for DAK attachment it is necessary to remove some items. The PXI instruments can vary slightly in appearance dependent on manufacturer and style. In this instruction sheet we cover the majority of PXI instruments. If the PXI instrument that you are using does not look like figure 2, please consult the appropriate DAK page on www.macpanel.com for specific assembly instructions.

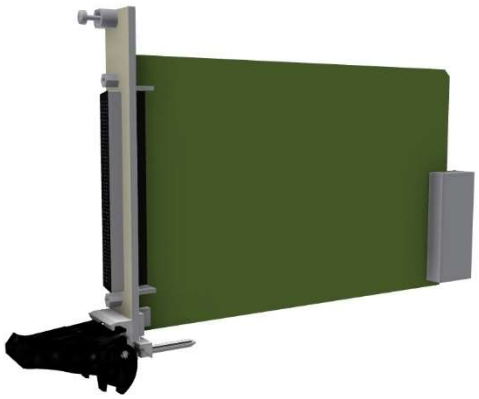

Figure 2 PXI instrument with standard ejector bracket and fixing screw

The first task is to remove the pin from the ejector bracket using the Ejector Pin Extraction Tool (part # 5515529) from the SCOUT tool kit

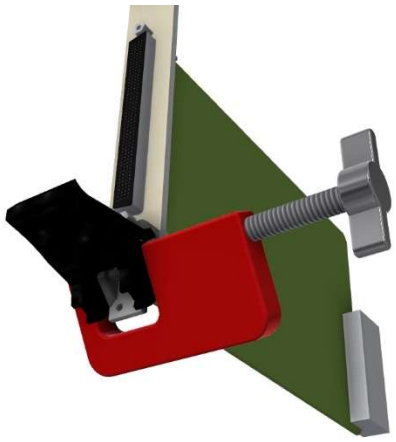

Figure 3 Ejector pin extraction tool

Align the ejector bracket pin with the tool pin and rotate the handle clockwise to eject the pin.

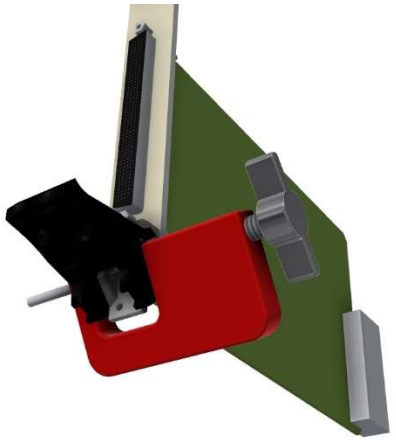

Figure 4 Align the tool with the ejector bracket pin

Discard the pin and rotate the tool handle counterclockwise to remove the ejector bracket from the PXI instrument

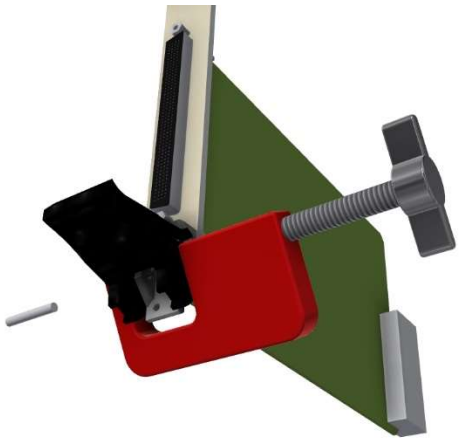

Figure 5 Rotate the handle counterclockwise

Remove the tool and discard the ejector bracket and pin

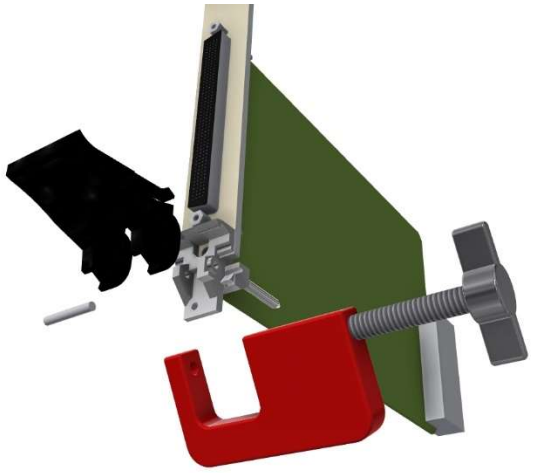

Figure 6 Discard ejector bracket

Step 2 Remove Top Nut from PXI Instrument

The top nut also needs removing. This is accomplished using the Nut Extraction Tool (part # 561588) from the SCOUT tool kit. First, remove the 2 screws in the tool

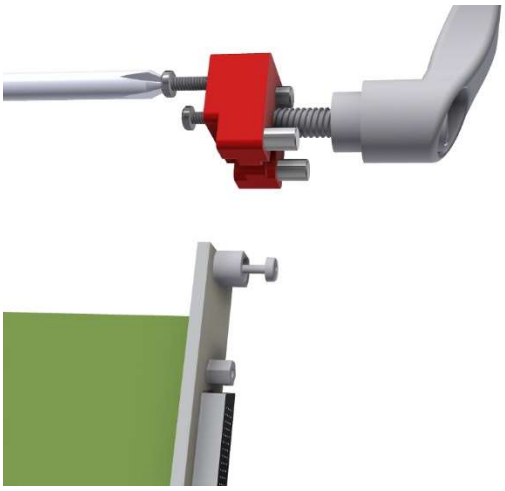

Figure 7 Remove screws from nut extraction tool

Slide the Nut Extraction Tool over the top nut on the PXI instrument

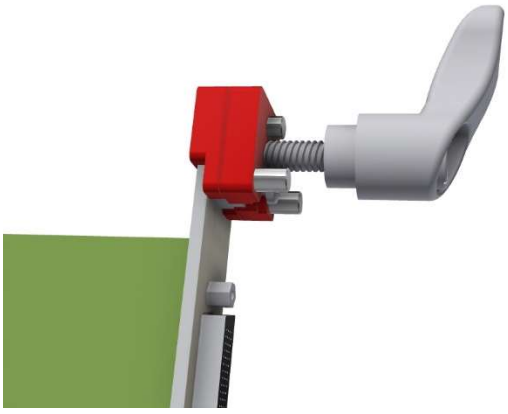

Figure 8 Locate the nut extraction tool on the PXI instrument

Rotate handle counterclockwise to pull nut away from the instrument

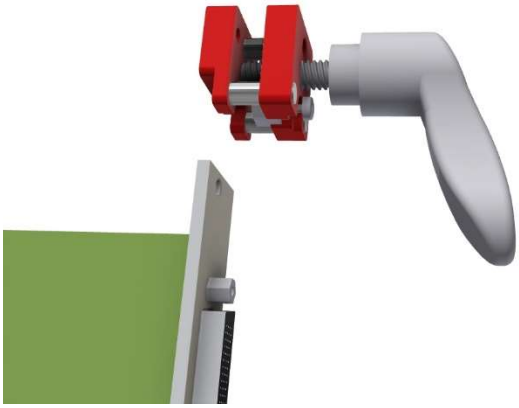

Figure 9 Rotate handle counterclockwise

The PXI instrument is now ready to be assembled to the DAK

Figure 10 PXI instrument ready for DAK attachment

Step 3 Confirm Flex Circuit Locating Posts are in position

Each DAK is supplied with 2 cover plates. Remove only the right cover plate as shown

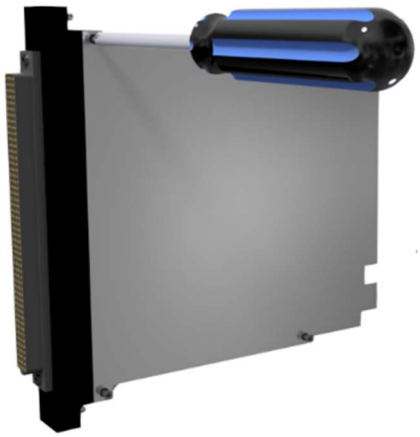

Figure 11 Remove right cover plate

Ensure that the 2 flex circuit retaining posts are in position. The posts are integral to the design as they ensure that the flex circuit remains mounted to the 200 position MAC Panel connector during installation and operation.

These should not be removed at this time but can be removed in the future if any maintenance work is required.

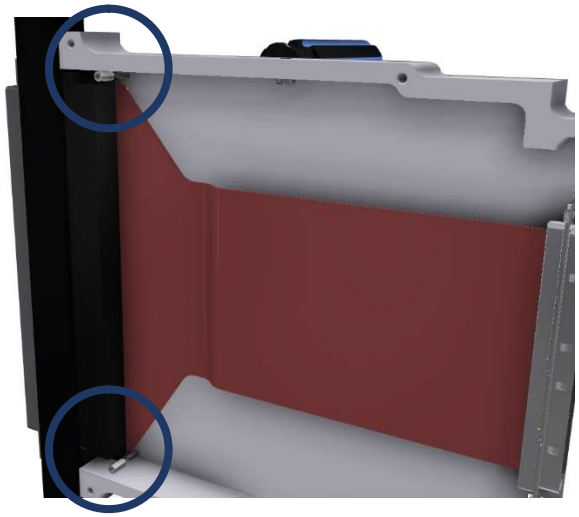

Figure 12 Ensure that flex circuit retaining posts are in position

Step 4 Attach DAK to PXI Instrument

Install the lower retaining bolt using the hex key supplied in the tool kit

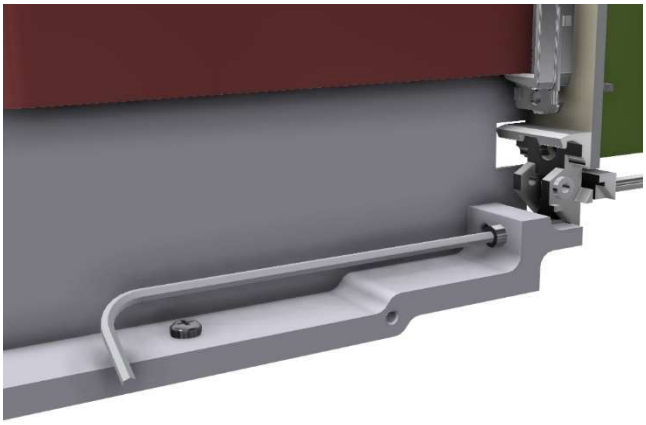

Figure 13 Install lower retaining bolt

It is critical that the T Bolt is correctly aligned within the assembly process. Incorrect alignment of the T bolt will result in incorrect mounting in the chassis.

Position the T bolt into the assembly and use the Alignment Tool (part # 412640) from the DAK tool kit to correctly align the head of the T bolt in a horizontal plane

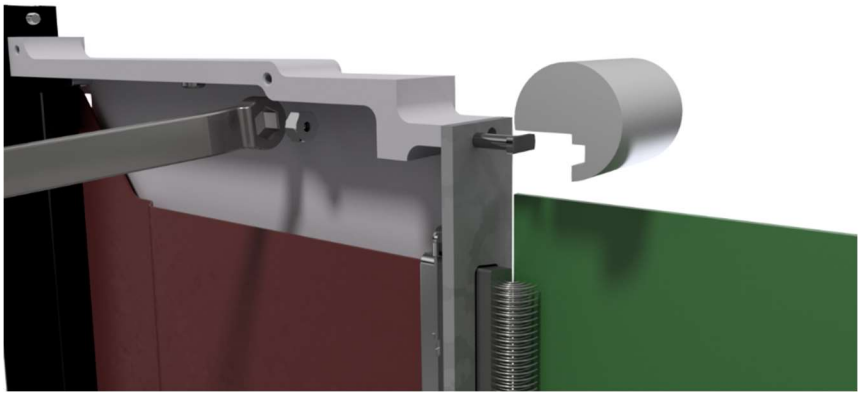

Figure 14 Use alignment tool to ensure that T bolt is correctly aligned

Tighten the nut onto the T bolt using the Combination Wrench (part #5210867), ensuring that the alignment tool remains correctly located

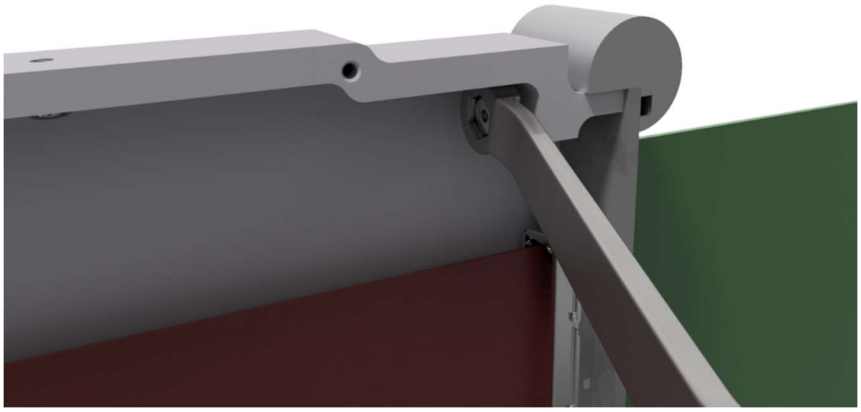

Figure 15 Tighten the T bolt ensuring correct alignment

Note that this operation can alternatively be performed using the Nut Driver (part # M8358A23)

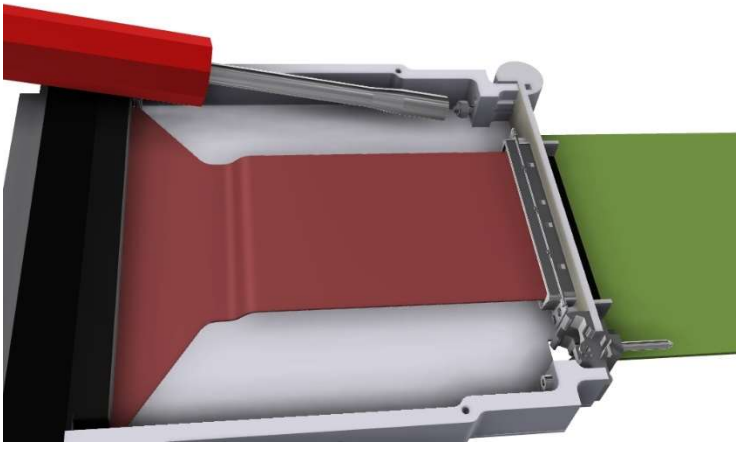

Figure 16 Alternative tool being used

Position the DAK against the PXI instrument and mate the flex circuit connector with the PXI instrument connector. Use the Allen key to tighten both screws

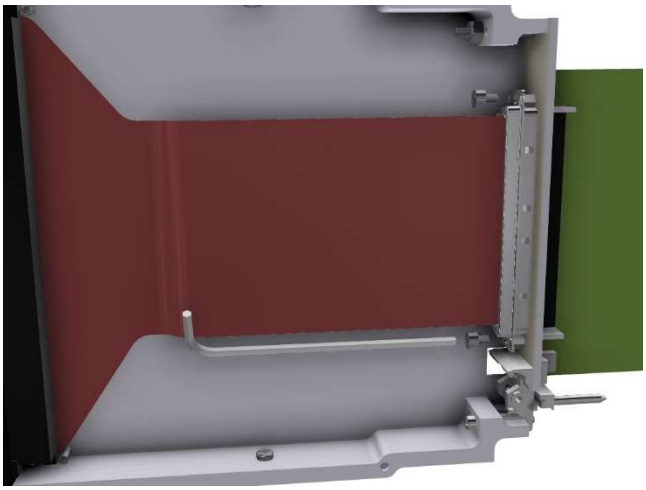

Figure 17 Attach flex circuit to PXI instrument

Re-attach the right cover plate

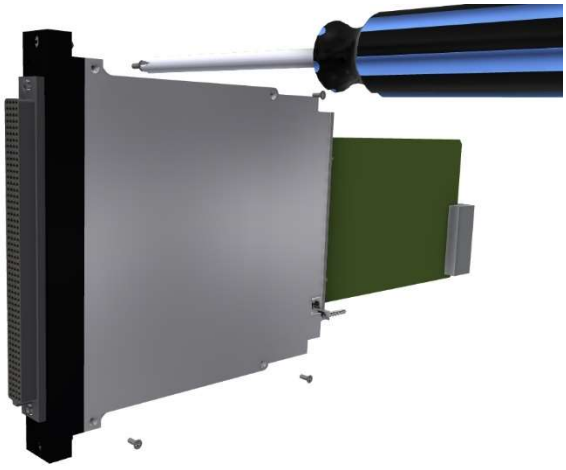

Figure 18 Attach right cover plate

Step 5 Check for Correct Assembly

It is critical that the DAK has been aligned with the PXI instrument. Ensure that the DAK and instrument are aligned in the location shown. A straight edge such as this rule can be used.

Figure 19 Ensure that DAK has been correctly assembled

The DAK is now ready to be assembled into the receiver and PXI chassis

Figure 20 Fully assembled DAK and PXI instrument

Appendix A Avoid Damage to Module Contacts

The MAC Panel contacts used in these DAKS are the strongest, most reliable contacts available for this style of connection. The vertical and horizontal distance between contacts (known as “pitch”) is an industry standard 0.100” (2.54mm). Almost all male contacts used on this pitch are 0.024” (0.6mm) diameter but the MAC Panel contacts are .040” (1.0mm) diameter. In practice this increases the strength by a factor of around 4x and means that they are virtually unbreakable in normal working conditions.

The female contacts have been designed to complement the larger male contacts and are equally robust and reliable. However, the female contacts can be damaged if an incorrect diameter probe is used during development or maintenance routines.

Only MAC Panel 1mm male contacts must be inserted into the female contacts.

Most probes supplied with handheld multimeters are larger diameter than 1mm. They may look quite similar but, in practice, will almost always damage the female contact leading to it having to be replaced.

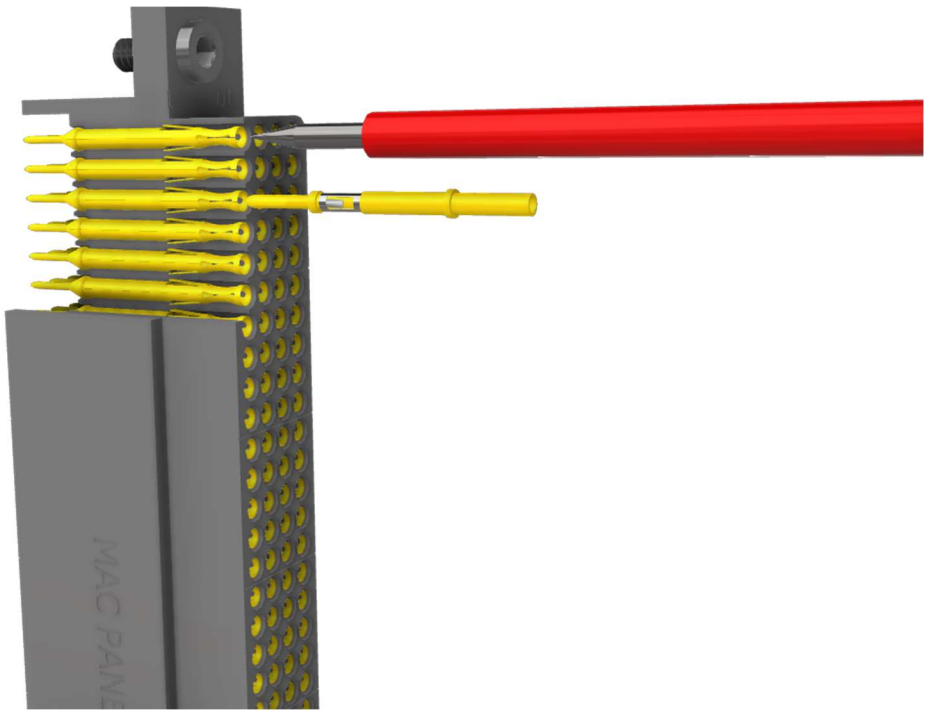

Figure 21 1mm contact and probe.

The female contact is designed so that 4 equally spaced “leaves” will move radially outwards when the male is inserted and will spring back to the original position when the contact is removed. Extensive testing shows that these contacts will perform in this manner for over 20,000 mating cycles.

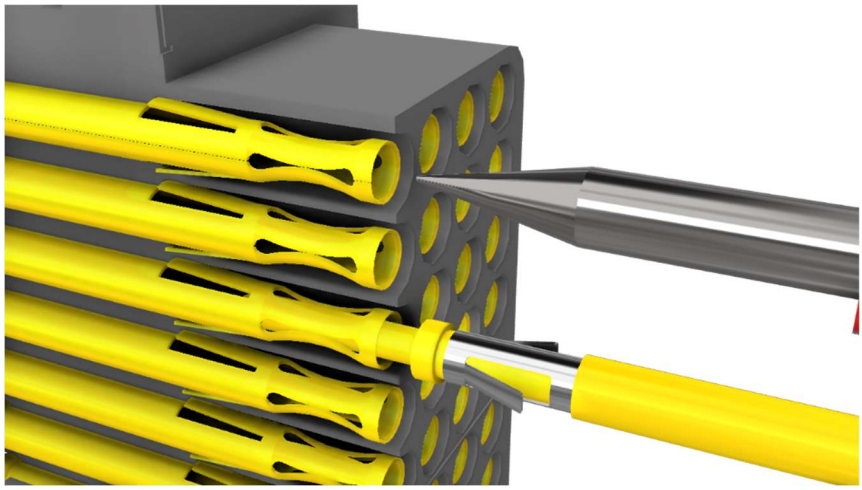

Figure 22 1mm contact inserted.

However, when a conventional multimeter probe is used the larger diameter stretches the leaves beyond their natural sprung state. In almost all circumstances this will damage the contact and the contact will have to be replaced

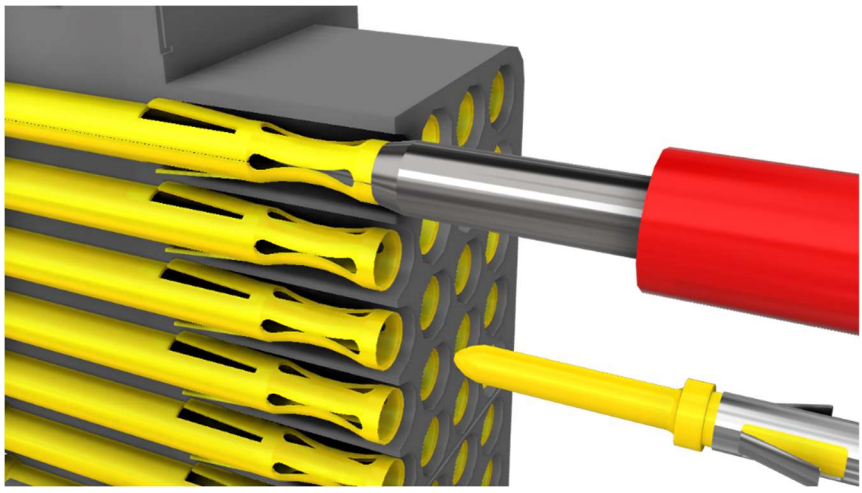

Figure 23 Probe inserted.

Below, the condition of the 2 contacts after the probe or contact has been removed can be seen.

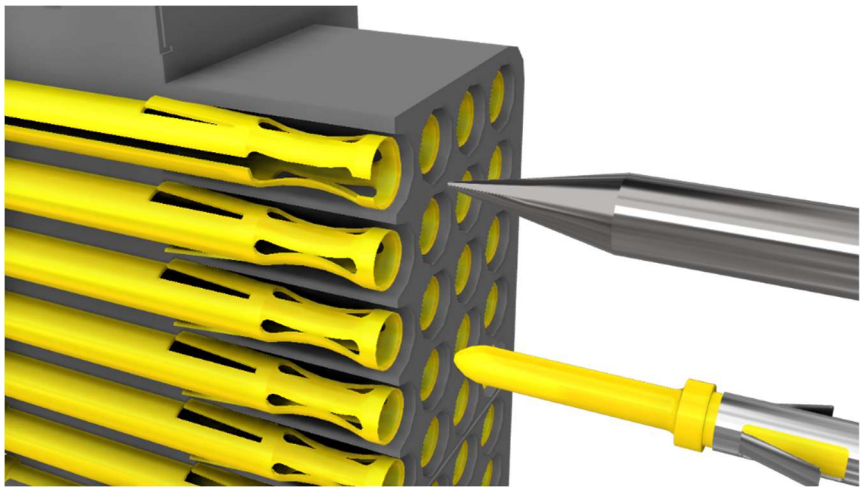

Figure 24 Damage caused by probe.

If the contact is damaged it must be replaced

Each contact can be replaced individually using MAC Panel extraction tool, part number 412801

Figure 25 Extraction Tool

Full instructions can be found on the MAC Panel website at

https://www.macpanel.com/wp-content/uploads/2018/08/IN91330-RevB.pdf

Appendix B DAK Tool Kit Contents

The DAK Tool Kit, part number 561211, includes all necessary tools to assist with satisfactory DAK assembly.

Figure 26 DAK Tool Kit

Location	Description	Part #
A	Alignment Tool	412640
B	Assorted Screwdrivers	#1 Philips #2 Philips 3/16” Slotted
C	Nut Extraction Tool	561588
D	Spare T bolts and nuts	5510941 4-40UNC
E	Patch cords for probing female contacts	PC 000 150 024 012
F	DAK Removal Tool	5212346
G	Combination Wrenches	3/16” 1/4”
H	Nut Driver	1/4”
J	Ejector Pin Extraction Tool	5515529
K	Hex Keys	
L	Spare Screws and nuts	