E5071C-50A

Information Only Service Note

Supersedes:
E5071C-50

E5071C ENA Series Network Analyzer

Serial Numbers: ALL
Manufacturing ID Number: N/A

E5071C 3.5mm NMD Connector Care

Parts Required:

Calibrated torque wrench – Table 1-1
Connector savers – Table 1-2

ADMINISTRATIVE INFORMATION

[ ] Calibration Required	PRODUCT LINE: WN
X Calibration NOT Required	AUTHOR: ls

ADDITIONAL INFORMATION:
This service note communicates the required procedures in mating and unmating the E5071C 3.5mm test port.

KEYSIGHT TECHNOLOGIES

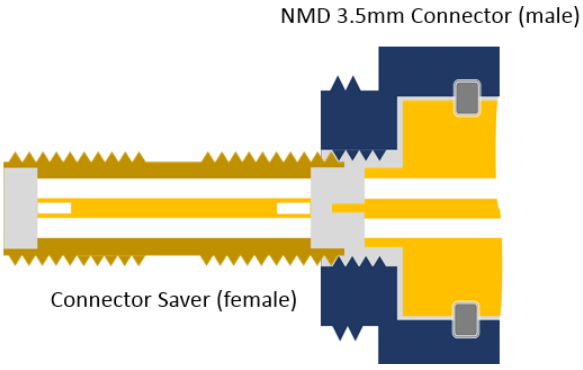
Situation:
Making Good Connections

Good connections require a skilled operator. The most common cause of measurement error is bad connections. The following procedures illustrate how to make good connections in case of 3.5mm connectors using f-f connector saver.

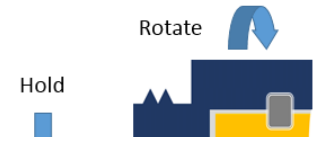
Solution/Action:
Making a Connection

1. Wear a grounded wrist strap having a 1 MW series resistor to protect instrument from ESD damage.
2. Inspect, clean, and gauge connectors. All connectors must be undamaged, clean, and within mechanical specification.

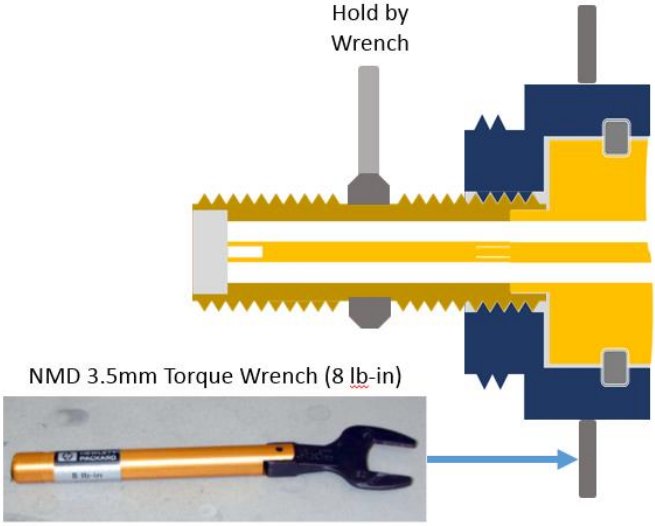
3. [Connector saver to NMD 3.5mm Connector] Carefully align center axis of both devices. Push the connectors straight together so they can engage smoothly. The male center conductor pin must slip concentrically into the contact finger of the female connector.



4. CRITICAL: Rotate only the 3.5mm Connector Nut until finger-tight, being careful not to cross the threads. Damage to both connectors will occur if the male center pin is allowed to rotate in the female contact fingers.

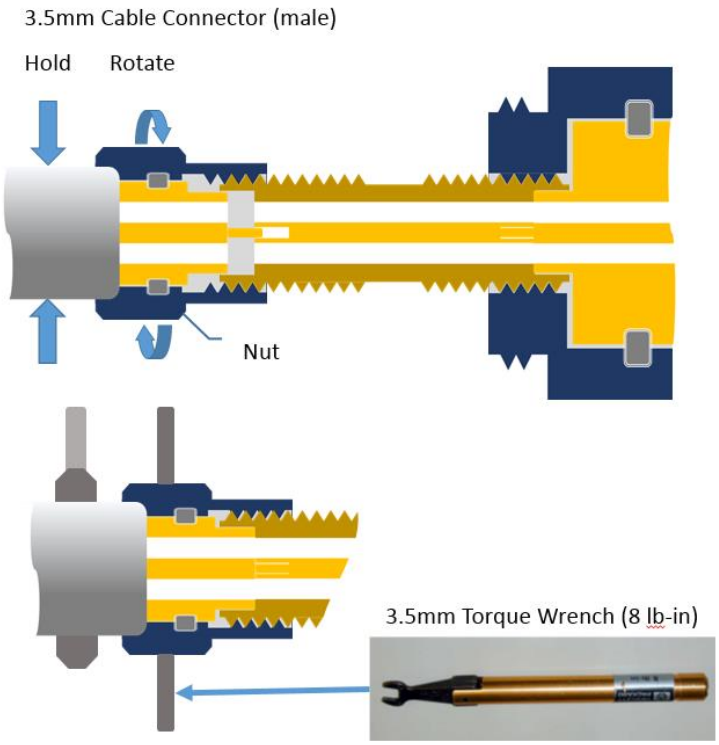


5. Use a torque wrench to make final connection. Tighten until the "break" point of the torque wrench is reached. Do not push beyond initial break point. Use additional wrench for holding Connector Saver, if needed, to prevent device body from turning.



6. [3.5mm Cable Connector to Connector saver] Repeat processes 3 to 5 for connecting 3.5mm Cable connector to Connector Saver:

✓ Align center axis of both devices.
✓ Hold cable side and rotate 3.5mm Connector Nut until finger-tight.
✓ Using a torque wrench, tighten until the "break" point while holding cable side, if needed, with another wrench.



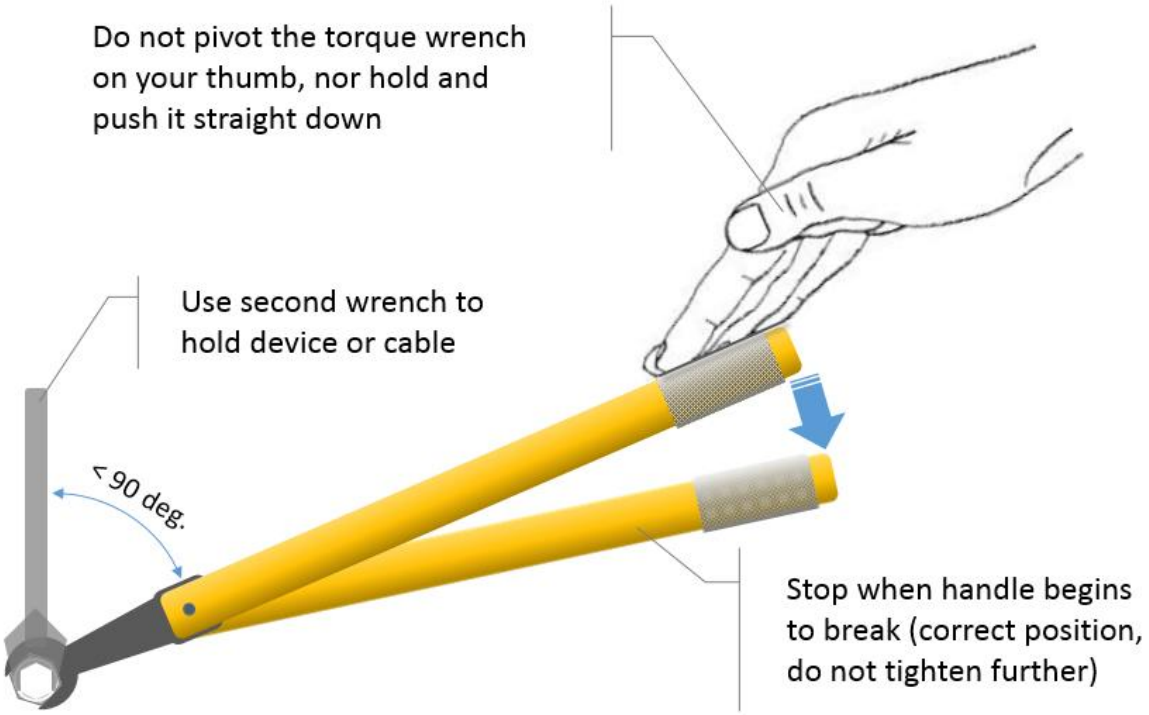
Separating a Connection

1. Support the devices to avoid any twisting, rocking or bending force on either connector.
2. Use an open-end wrench to prevent the device body from turning.
3. Use another open-end wrench to loosen the connector nut.
4. Complete the disconnection by hand, turning only the connector nut.
5. Pull the connectors straight apart.

Using a Torque Wrench

Proper torque on the connector improves measurement repeatability and extends connector life. The tightening torque on connectors has a significant effect on measurements at mm-wave frequencies. Repeatable measurements require consistent torque on all the connections in a setup. A torque wrench avoids damage due to over-tightening and helps connectors achieve their rated lifetimes.

1. Make sure torque wrench is set to the correct torque setting.
2. Position torque wrench, and a second wrench to hold the device or cable, within 90° of each other before applying force. Make sure to support the devices to avoid putting stress on the connectors.
3. Hold torque wrench lightly at the end of handle. Then apply force perpendicular to the torque wrench handle. Tighten until the "break" point of the torque wrench is reached. Do not push beyond initial break point.



Torque Settings

Table 1-1

Types	Torque Setting	Wrench Part Number
1.0 mm	4 in–lb (45 N–cm)	8710–2079
1.85 mm	8 in–lb (90 N-cm)	8710-1765
2.4 mm	8 in–lb (90 N-cm)	8710-1765
NMD 2.4 mm	8 in–lb (90 N-cm)	8710-1764
2.92 mm	8 in–lb (90 N-cm)	8710-1765
3.5 mm	8 in–lb (90 N-cm)	8710-1765
NMD 3.5 mm	8 in–lb (90 N-cm)	8710-1764
SMA	5 in–lb (56 N-cm)	8710-1582

Note: An SMA torque wrench is NOT structurally identical to a 3.5 mm torque wrench. They have similar shape but different coupling torque. (3.5mm: 8 in-lb, SMA: 5 in-lb, both widths across coupling nut wrench: 5/16")

- To connect an SMA male to a 3.5 mm female connector, use an SMA torque wrench.
- To connect a 3.5 mm male connector to a SMA female connector, use a 3.5 mm torque wrench.

Table 1-2
Listed are the connector savers commonly available for E5071C NMD 3.5mm test port.
Refer to the RF and Microwave Test Accessories catalog for the comprehensive references of the entire connector savers family.

Types	Connector Saver	Description
3.5mm	85130D	NMD 3.5 mm to 3.5 mm adapter set. 85130D consists of 85130-60005 (Qty.1) and 85130-60006 (Qty.1)
	85130-60005	NMD 3.5mm Female - 3.5mm Female adapter
	85130-60006	NMD 3.5mm Female - 3.5mm Male adapter
	83059B	Coaxial Adapter, 3.5mm Female-Female
	83059C	Coaxial Adapter, 3.5mm Male-Female

Appendix
Additional References

What Torque Wrenches and Open-Ended Wrenches Does Keysight Recommend for Connecting RF Connectors?
http://www.keysight.com/main/editorial.jspx?cc=MY&lc=eng&ckey=2516881&id=2516881

http://www.keysight.com/main/editorial.jspx?cc=MY&lc=eng&ckey=1000003678:epsg:faq&nid=-33186.897439&id=1000003678:epsg:faq

Millimeter Wave Connector Care
http://na.support.keysight.com/pna/connectorcare/Connector_Care.htm

RF and Microwave Test Accessories Catalog
http://literature.cdn.keysight.com/litweb/pdf/5992-0314EN.pdf?id=2600695

Revision History:

Date	Service Note Revision	Author	Reason for Change
3 March, 2017	E5071C-50	tm	As Published
15 March, 2017	E5071C-50A	tm	Included connector savers product models, part numbers made available for E5071C 3.5mm test port.