RUSSTECH ENGINEERING

PREFLITE®

TOOLS FOR CRITICAL-FUNCTION INTERCONNECTS

USER MANUAL

CONTACT RETENTION TEST TOOL
RTTL0002 SERIES

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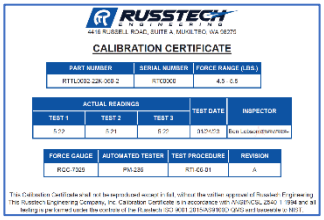
1 INTRODUCTION

Thank you for purchasing a Russtech Engineering Contact Retention Test Tool. These tools have been designed to safely test the proper installation of crimp style removable contacts in a broad range of connector types.

The Russtech Engineering Contact Retention Test Tool is an integral part of a robust quality system.

2 WHAT IS IN THE BOX?

	RTTL0002 Tool	QTY 1
	Test Probe (Installed)	QTY 1
	Calibration Certificate	QTY 1

3 WHY TEST CONTACT RETENTION?

Testing contact retention ensures that when a cable assembly is installed in its application the contact engagement is reliable. Contacts that are not properly seated can disengage from their mated contact due to vibration or simply just the action of mating the two connectors. This can cause intermittent connectivity, or in extreme cases, arcing and sparking in power applications. By testing that each contact is properly seated and the connector's retention mechanisms are engaged, these conditions can be significantly reduced if not completely eliminated.

4 CONTACT RETENTION TESTING – A SIMPLE EXPLANATION

Contact retention testing, also known as “contact seating verification”, ensures that a contact has been properly installed: fully seated and engaged by the connector’s contact retention mechanism.

There is a common misconception that the test forces used are those identified by the connector manufacturer as the contact retention force value. When testing contact retention, it is not the goal to bring the connector contact retention mechanism to the point of failure; rather, it is to safely ensure the contact is seated and fully engaged by the connector’s contact retention system without causing damage to the contact or connector. For this reason, the test forces used are much less than those specified by the connector manufacturer.

The following table provides a general starting point for various contact sizes. These values reflect the force values listed in the IPC/WHMA-A-620E-S (Space and Military Addendum) and NASA MSFC-STD-781. Some connectors may require a higher or lower force to properly test contact retention.

MECHANICAL CONTACT RETENTION PUSH FORCES	
CONTACT SIZE	FORCE (lbs)
22	4 to 6
20	5 to 7
16	8 to 10
12	10 to 12

For contact sizes not listed in the above table the required force shall be calculated as 30% +/- 5% of the contact retention force shown on the connector data sheet.

NOTE: It is the user’s responsibility to validate the force values required for specific applications.

5 HOW TO TEST CONTACT RETENTION

5.1 Install properly sized test probe in the RTTL0002 handle. Probes are inserted in the wing stop end of the tool and pushed in until snapped into place and fully seated.

NOTE: Test probes have two ends, one for testing pins and one for sockets. Ensure that the proper configuration is chosen. Generally, the pin side is plastic, and the socket side is metal. If there is any question, refer to the RTTL0002 sales drawing for clarification.

5.2 TESTING A CONTACT

5.2.1 When testing a PIN or SOCKET style contact align the probe with the contact to be tested, holding the tool perpendicular to the connector insert face.

NOTE:

PIN probes are plastic and have an indentation that will prevent it from sliding off the pin contact during the test.

SOCKET probes are metal and are intended to fit inside the socket contact for testing. (See above example)

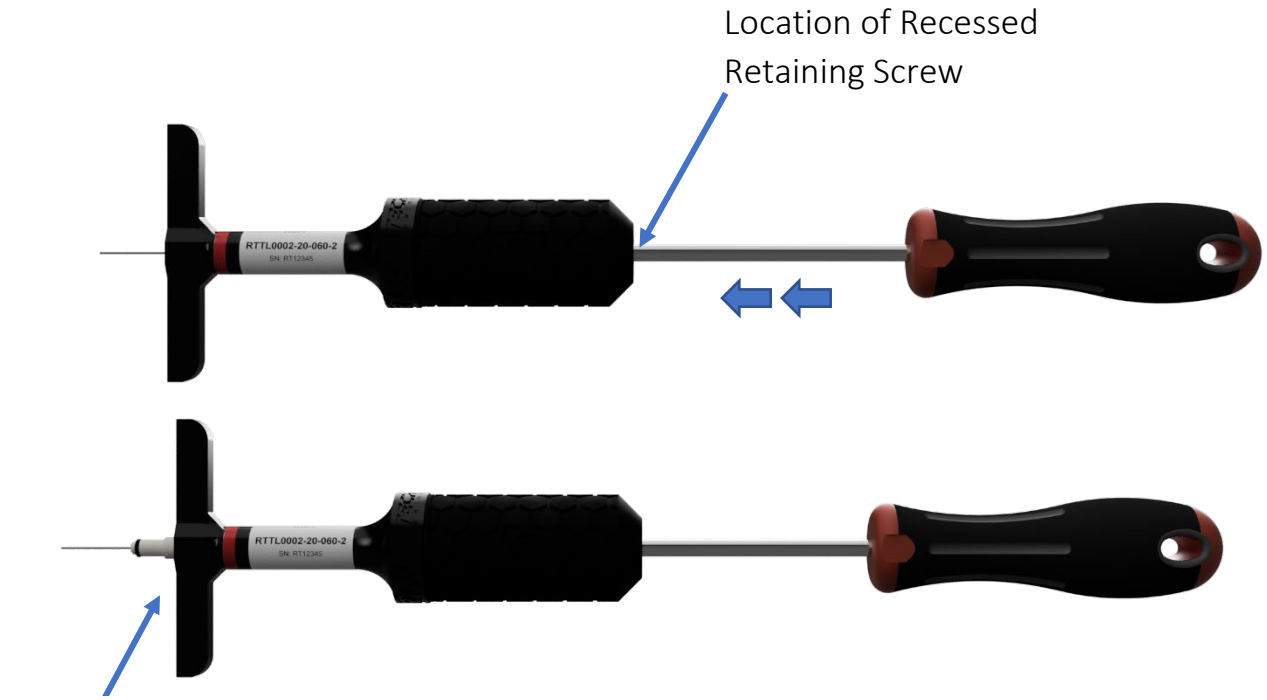
5.2.2 Maintaining alignment, push firmly on the contact until the tool releases indicating a properly seated contact. If the contact moves back into the connector this indicates that the contact was not fully seated in the connector and will require further action to rectify the problem.

NOTE: In either case, the forward motion of the tool will stop when the WING STOP meets the connector face or shell.

5.2.3 Disengage the tool and proceed to the next contact.

6 TEST PROBE REMOVAL

Test probes can be removed from the tool handle by simply pushing on the recessed retaining screw located in the back of the tool handle using a screwdriver or another similar solid object. NOTE: DO NOT ATTEMPT TO UNSCREW THE RECESSED RETAINING SCREW.



Once the probe is pushed out of the tool, firmly grip the probe, and pull it until it releases from the tool shaft.

7 CLEANING AND MAINTENANCE

The Contact Retention Test Tool requires no specific maintenance. Contaminants on the tool surface can be cleaned using alcohol and a non-abrasive cloth.

Contact Retention Test Probes are consumable items and replacements can be purchased as needed. Visit our website using the link or QR code below for information on ordering replacement probes.

Each probe contains O-Rings. It is necessary to periodically inspect the O-Rings for any cracks or deformities that would require replacement. O-Ring replacement kits are available. Visit our website using the link or QR code below for information on ordering replacement O-Rings.

As a preventative measure lubricating the O-Rings with Super Lube® 92003 or equivalent will extend the life of the O-Rings.

DISCLAIMER: It is the customer's responsibility to ensure tools are performing within their specified force range. To ensure testing is performed consistently and accurately it is required to use the Russtech Engineering Automated Tool Tester (PN: RTTE0001-25) to verify proper operation.

8 CALIBRATION VERIFICATION

The Russtech Contact Retention Test Tool is designed to operate within specific force values. It is the end user's responsibility to ensure that the tools stay within these parameters during their lifecycle.

Break-Force tools require a method of testing that can produce consistent results every time. The Russtech RTTE0001-25 Automated Tool Tester has been designed to produce consistent and accurate test results by using the following parameters:

Rate of Test: 30 mm/S
Distance to Full Compression: ~24mm
Time to Full Compression: ~0.8S

NOTE: Tools should be cycled five (5) times before performing any calibration verification tests to allow the tool to settle.

TEST

Using the following table as reference for acceptable limits when using the Russtech RTTE0001-25 Automated Tool Tester, perform the test three (3) times recording the value and zeroing the force gauge between each test:

TABLE 8.1

Nominal Tool Force	Tolerance	Minimum (lbs.)	Maximum (lbs.)
3.5 lbs.	±0.5 lbs.	3.01	3.99
4.5 lbs.	±0.5 lbs.	4.01	4.99
5.0 lbs.	±0.5 lbs.	4.51	5.48
6.0 lbs.	±0.5 lbs.	5.52	6.48
9.0 lbs.	±1.0 lbs.	8.02	9.97
10.5 lbs.	±0.5 lbs.	10.03	10.97
11.0 lbs.	±1.0 lbs.	10.03	11.96

RESULTS

If any of the three (3) recorded measurements are outside of the minimum or maximum values listed in Table 8.1 then the tool fails calibration verification and should be retired from service and replaced.

9 ADDITIONAL RESOURCES

Russtech Engineering Co. Inc.
4416 Russell RD STE A
Mukilteo, WA 98275
1-855-RUSSTECH (787-7832)
https://russtechengineering.com/