



## TECHNICAL NOTE

#21

Revised

July, 2002

There have been many questions regarding the calibration and maintenance of our tools. The use of defective tooling, tooling that is out of calibration, or marginally within calibration will, when used, cause a connector to either completely fall off the cable, the crimp sleeve to rotate on the cable, or reduce the retention force that a connector will withstand when pulled.

When an installer has a crimping problem, they routinely point the finger at the connector as the cause, and typically will focus on the crimp sleeve. This should be a warning flag to immediately withdraw the tool from use. The tool should be inspected for damage, the closure force should be checked to ascertain whether the tool is in calibration, the die checked for excessive wear, or whether the die's placement in the jaws of the tool is *the cause of your* problem.

### Calibration Frequency and Closure Force

***The following are based on commonly used cables in the DS3 telco central office in North America. Physical cable construction differs from manufacturer to manufacturer. Therefore, individual results regarding cable retention may vary from one manufacturer's cable to another.***

The Trompeter crimp tool CT4L is calibrated at the factory prior to shipment to a Trompeter customer. This calibration is to correct for the natural variation in the closure force that is in the design itself and does adjust for any tool-to-tool variation as manufactured. The adjustment wheel has 9 settings, 1 being the least, 9 the highest. Once a tool has reached the setting of 9, the tool can no longer be adjusted to a higher closure force.

Trompeter uses a custom fixture and a precision strain gauge to check closure force. An alternative way to check whether a tool is in calibration is to measure the hex dimension of the crimp sleeve after crimping. Regarding 735 cable and connectors, if the crimp sleeve measures 0.190 inches or less across any two out of three of the "flats" of the hex in the crimp sleeve, then the tool is applying a sufficient crimp force. If the measurement exceeds this criteria, then the tool should be pulled from service for evaluation and/or recalibration. If installer or cable embossing is done on the crimp sleeve at the time of crimping, do not take measurements over the embossing itself. Measurement equipment recommended for this testing is either a precision micrometer or a "go-no go" gauge.

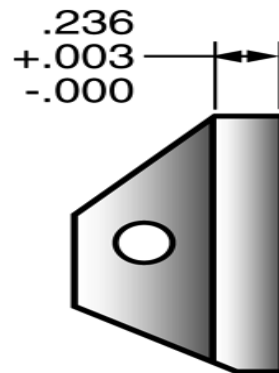
Factory (non-portable) test instruments such as the Alpatron by Daniels, or a Chatillon pull test gauge have been used for many years to check closure force by measuring the cable retention strength to failure – a destructive test – on a connector assembled to a cable. One of the Regional Bell Operating Companies (SBC) has authorized the use of a field pull tester. Trompeter has introduced the 010-0189 is now available from Trompeter to do this destructive test in a portable hand held unit..

Hand tools should be routinely monitored for performance. There is no set amount of crimps that will cause a tool to fall out of calibration. Beyond the examples cited above, there are however, other good rules to follow regarding tool calibration:

1. Anytime a connector does not properly retain itself on a cable, the tool should be immediately taken out of service and checked for adequate closure force.
2. Any time the assembler feels that the tools is not delivering a proper closure force. This is typically learned through experience, yet it is always better to error on the side of caution.

### **Excessive Die Wear**

Excessive die wear, while rare, can also reduce the closure force that the crimp tool can deliver. If a tool is marginally within calibration, this may be a determining factor as to whether the connector will be properly crimped. To determine whether a die is excessively worn, refer to the figure 1. The dimension is applicable for all dies. Both die faces should be measured. If the measurement on either die face is at, or below 0.235 inches, then the entire die should be replaced.



**Figure 1**

### **Die Placement**

Placement of the die into the tool is also critical. Place the die into the tool leaving the die screws partly threaded but loose, place an uncrimped connector crimp sleeve by itself in the appropriate die cavity, hold it there with a thumb and forefinger and apply a slight amount of crimp pressure onto the sleeve. The result will be the placement of a near perfect cylinder in the die cavity forcing the two die halves to move into alignment. Once the die halves have been moved into position by the yet uncrimped sleeve, the die screws should then be completely tightened down. The crimp frame should then be closed for the rest of the cycle until the ratcheting mechanism releases the sleeve, thereby signaling the end of the crimp process. The sleeve should then be measured to confirm that the dimensional specifications previously addressed in this tech note are met by use of

an accurate micrometer or a “go, no-go” gauge. Note that if the jaw is completely shut before tightening the die screws, this can lead to an even larger loss of closure force.

Consequences related to using visual “eyeballing” of the alignment of the die sets can be “ovaling” (where the crimp flats are not flat) and/or “flagging” (where the edges of the crimp flats may not overlap perfectly, extruding the metal into a protrusion).

### **Maintenance**

Instructions for routine tool maintenance are enclosed by the factory, and will not be addressed here. Regular maintenance will prolong the life of the tool.

### **Calibration**

Trompeter has instituted a program in which crimp tools can be returned for inspection, and if necessary, calibration. The tool should be returned using the Return Material Authorization (RMA) process as a Category 7 customer accommodation. A \$25 fee will be charged for this service. Tools that are defective, and cannot be calibrated will be returned as received. This program should not be construed as a full service calibration program.

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