

## INSTRUCTIONS FOR USE OF T5 CABLE TENSIO METER



### **GENERAL INFORMATION**

The removable Risers are to accommodate different sizes of cable. It is through the use of Risers of different height that one instrument is able to measure tensions of various cable sizes (depending on the model). **The correct Riser must be used for the cable size under test; otherwise false readings or damage to the instrument will result.** Consult the Calibration Card (included) for tension range, cable size and proper riser.

The Indicator Dial is an arbitrary scale reading from 0 to 100. The cable tension, which can be measured on different size cables for any given model of the Indicator, are clearly shown on the Calibration Card, attached to the carrying case. This involves the conversion of the dial readings into pounds by means of the Calibration Card, previously mentioned.

Standard preformed Aircraft Cable is used in calibrating, 7 x 7 or 7 x 19 stranding in cables of 1/16" and 3/32", and 7 x 19 stranding in cables 1/8" through 3/8" sizes. The Tensiometer instrument shall be calibrated on the same type of cables on which the Tensiometer instrument will be used (such as coated cables used externally on helicopters). The T5 series cable Tensiometer are standard calibrated on Flexible, wire rope, for aircraft control cables. When using coated cables, select the appropriate size of riser to accommodate the cables increased size. Annotate riser used on the Certification label and/or Calibration Chart. Riser must be sized the cable's outside diameter. Flexible cables, either coated or non-coated, shall conform to MIL-DTL-83420. Most Aircraft systems use the Flexible cable. Some aircraft, (A-10 and F-15), use both Flexible and Non-Flexible cables.

A Tensiometer instrument calibrated on Flexible cable will not give accurate tension readings when measuring Non-Flexible cable. Non-Flexible cables shall conform to MIL-DTL-87161, (Supersedes MIL-W87161 & MIL-W-5693). Again, the Tensiometer instrument shall be calibrated on the same type of cables on which the Tensiometer instrument will be used.

In testing or calibrating the instrument, a dead weight arrangement is always accurate and preferable. However, this may be done in a testing machine against a hydraulic gauge or other measuring device. **In this case it is important that the reading of the check gauge or scale be taken after the test load of the tensiometer is applied.**

The attitude of the Indicator does not affect the readings – i.e., it makes no difference whether the Indicator is in a vertical or horizontal attitude, or at any point between these positions.

**WARNING**  
**USE OF TENSIO METER ON CABLE SYSTEMS EQUIPPED WITH CABLE TENSION**  
**REGULATORS**

**Cable Tensiometer should not be used for adjusting the rig load in a cable system where an automatic cable tension regulator is installed. In all cases, such cable systems should be rigged by adjusting them so that the pointer on the cable tension regulator scale indicates the correct number based on the surrounding temperature, as indicated on the chart provided in the Airplane Service Manual. The Tensiometer may be used to check the tension obtained, but it must be remembered that the actual cable tension will vary from the nominal, depending upon the errors in the instrument itself, manufacturing tolerance of springs in the regulators, rate of the regulator spring, and condition of the control cable. Cable tension readings taken on regulated control systems by means of a Tensiometer could, therefore, be misleading.**

## TO TAKE READINGS

1. Confirm cable size being tested using the supplied cable diameter gauge.
2. Select the proper Riser No. for the cable size being tested from the top of the Calibration Table, which indicates the Riser number applicable for the different cable sizes. Insert the Riser on the pin located at the upper center of the instrument.
3. Open the Trigger by moving it away from the carrying case and place the instrument on the cable being tested.
4. Close the Trigger; note the reading on the scale. Convert the scale reading into pounds using the supplied Calibration Table. The scale reading is given in the column headed by the cable size being tested and the corresponding pounds is given in the column headed "Cable Tension", reading across.
5. Remove the instrument from the cable by opening the Trigger. This retracts the Riser and releases the instrument, allowing it to slide free from the cable.

Due to the uneven surface of stranded cable, slight variations in reading may occur on the same cable at the same tension. This is particularly true of 5/32" diameter cable and larger. To obtain the greatest possible accuracy, it is recommended that three to five readings be taken at slightly different locations on the cable and these values averaged. This will tend to eliminate the effect of cable variation and obtain the maximum degree of accuracy.

### WARNING

**Do not overload the instrument – that is, permit the Pointer to go beyond the "100" mark on the Dial. When first applying to a tight cable, close the Trigger slowly and watch the Pointer to be sure it will not go above the "100" mark when the load is fully applied. Permanent damage may be done to the instrument if overloaded.**

## TO TAKE READINGS WHEN DIAL CANNOT BE SEEN

If the Dial cannot be seen when the instrument is on the cable, the Pointer may be locked at its reading position. **Before** releasing the Trigger, press forward (toward the Dial) on the small lever located at the upper left-hand side of the instrument. After the Pointer has thus been locked in reading position, the Trigger is released. The instrument can now be removed from the cable and the reading taken. The Pointer is then returned to "0" by reversing the movement of the locking mechanism. **Do not set lock before clamping instrument on cable as incorrect reading will result.**

## ADJUSTMENT AND REPAIR

If adjustment or repair is necessary, return the instrument to OPTI Manufacturing Corp. or utilize the Service and Parts Catalog which may be obtained from OPTI Manufacturing Corporation. For return units under a warranty claim, please contact us first in order to obtain a *Return Material Authorization* (RMA) number.



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