*TB 9-6635-203-35

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR DIAL INDICATING TENSIOMETERS MIL-T-7638 AND MIL-T-38760

Headquarters, Department of the Army, Washington, DC
23 March 1989

TB 9-6635-203-35, 21 September, 1985, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page.

Remove pages	***Insert pages***
1 and 2	1 and 2
5 and 6	5 and 6

2. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army

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General, United States Army
Chief of Staff

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You can help improve this publication by calling attention to errors and by recommending improvements and stating your reasons for the recommendations. Your letter or DA Form 2028, Recommended Changes to Publications, should be mailed directly to Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-TMD-LP, Redstone Arsenal, AL 35898-5000. FAX to DSN 788-2313 (commercial 256-842-2313). A reply will be furnished directly to you.

*This bulletin supersedes TB 9-6635-203-35, 28 December 1984.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Dial Indicating Tensiometers MIL-T-7638 and MIL-T-38760. The manufacturer's manual, MIL-T-7636, and MIL-T-38760 were used as the prime data sources in compiling these instructions. The equipment being calibrated will be referred to as the TI (test instrument) throughout this bulletin.

a. Model Variations. Locations of handle latch, pointer, actuating handle, and unlock button varies according to manufacturer.

b. Time and Technique. The time required for this calibration is approximately 1.5 hours, using the physical technique.

2. DA Form 2416 (Calibration Data Card). Forms, records, and reports required for calibration personnel at all levels are prescribed by TB 750-25. DA Form 2416 must -be annotated in accordance with TB 750-25 for each calibration performed.

3. Calibration Description. TI parameters and performance specifications which pertain to this calibration are listed in table 1.

Table 1. Calibration Description

Test instrument parameters	Performance specifications
Tension (weight)	Range: 10 to 200 lbs Accuracy: ±5% of averaged 3 readings

SECTION II
EQUIPMENT REQUIREMENTS

4. Equipment Required. Table 2 identifies the specific equipment to be used in this calibration procedure. This equipment is issued with Secondary Transfer Calibration Standards Set AN/GSM-287. Alternate items may be used by the calibrating activity when the equipment listed in table 2 is not available. The items selected must be verified to perform satisfactorily prior to use and must bear evidence of current calibration. The equipment must meet or exceed the minimum use specifications listed in table 2. The accuracies listed in table 2 provide a four-to-one ratio between the standard and TI.

5. Accessories Required. The accessories listed in table 3 are issued as indicated in paragraph **4** above and are used in this calibration procedure. When necessary, these items may be substituted by equivalent items, unless specifically prohibited.

Table 2. Minimum Specifications of Equipment Required

Item	Common name	Minimum use specifications	Manufacturer and model (part number)
A1	BALANCE WEIGHT SET	Range: 1 to 12.8 oz Accuracy: Class C	(7910419)
A2	BALANCE WEIGHT SET	Range: 5 to 150 lbs Accuracy: Class T	(7910346)
A3	HANGER ASSEMBLY	Range: 5 lbs Accuracy: ±0.02 lbs	(7916702) (p/o 7916705)
A4	STANDARD WEIGHT SET	Range: 1 to 40 lbs Accuracy: Class T	(7909056)

Table 3. Accessories Required

Item	Common name (official nomenclature)	Description (part number)
B1	CABLE	(7916704) (p/o 7916705)
B2	CABLE HOLDER	(7916703) (p/o 7916705)
B3	MECHANICAL LOADER	Loader with extended leg (7916274)
B4	MOUNTING PLATE	Capable of supporting mechanical loader (7915876)

SECTION III
CALIBRATION PROCESS

6. Preliminary Instructions

a. The instructions outlined in paragraphs **6** and **7** are preparatory to the calibration process. Personnel should become familiar with the entire bulletin before beginning the calibration.

b. Items of equipment used in this procedure are referenced within the text by common name and item identification number as listed in tables 2 and 3. For the identification of equipment referenced by item numbers prefixed with A, see table 2, and for prefix B, see table 3.

NOTE

Unless otherwise specified, verify the result of each test and, whenever the test requirement is not met, take corrective action before continuing with the calibration. Adjustments required to calibrate the TI are included in this procedure. Additional maintenance information is contained in the manufacturer's manual for this TI.

NOTE

Unless otherwise specified, all controls and control settings refer to the TI.

7. Equipment Setup

a. Remove TI and calibration bar from carrying case.

b. Compare serial number on name plate of TI with serial number stamped on tab of calibration bar; these serial numbers must agree.

c. Rotate cable size-gage ccw against stop pin (fig. 1).

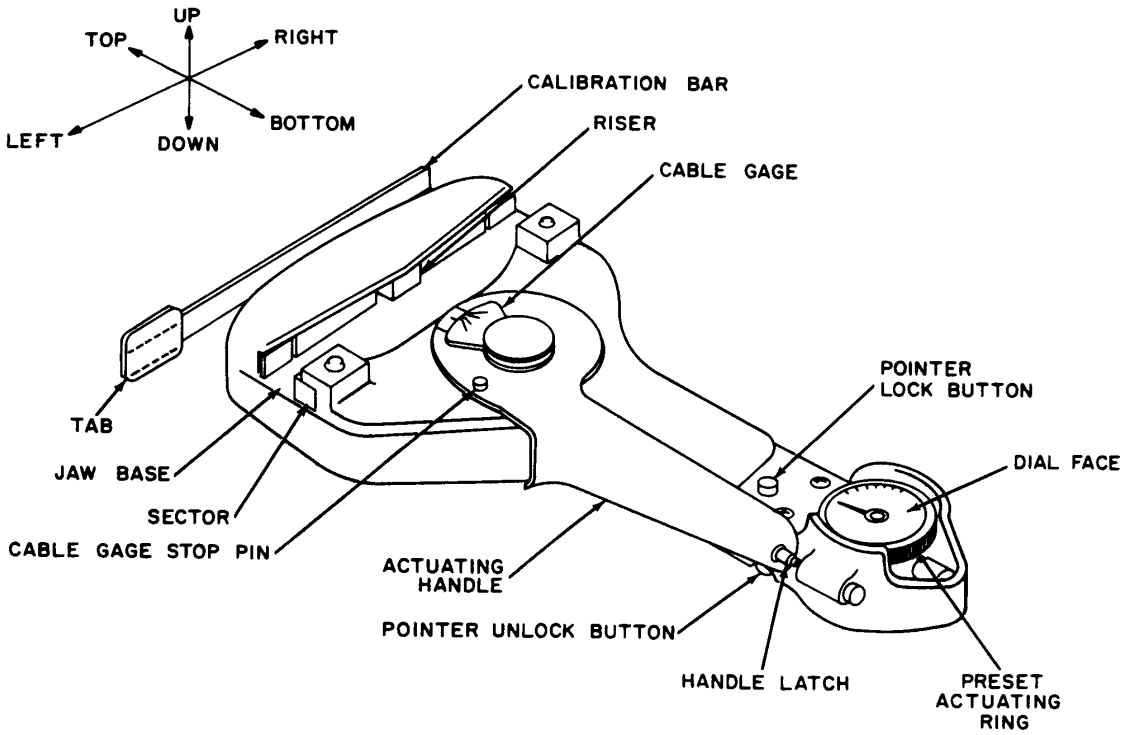

Figure 1. Dial indicating tensiometer (typical).

d. Turn bezel until indicator dial indicates $^{1}/_{16}$.

NOTE

This setting must be changed to correspond to size of cable being used.

e. Compress TI actuating handle and insert calibration bar into jaws with calibration bar tab to left (fig. 1).

f. Release actuating handle completely.

NOTE

The actuating handle is retained by a handle latch. When actuating handle is compressed, handle latch is automatically released downward. To relatch, compress handle against side of frame and push handle latch upward into detent in actuating handle. Then slowly release hand compression (fig. 1).

WARNING

When relatching, be sure handle latch is in detent before releasing compression on actuating handle; otherwise, handle will snap open and may cause personal injury.

g. Indicator dial will read within ±2 percent of reading stamped on calibration bar.

h. Compress actuating handle and remove calibration bar, carefully relatching actuating handle.

i. Set up equipment as shown in figure 2.

j. Tare weight of hanger assembly (A3) must be included as part of the total weight used in each test.

8. Dial Indicating Tensiometer

a. Performance Check

(1) Rotate knurled rim of indicator dial on TI until pointer indicates the cable diameter being used.

(2) Rotate cable size-gage on TI ccw against the stop pin.

(3) Increase tension on cable by adding weights from balance weight sets or standard weight set (A1, A2, or A4) to hanger assembly until total weight (tare weight plus added weight) equals 25 pounds.

(4) Apply TI to cable (B1) by compressing actuating handle and making certain that cable is aligned in the jaws and against jaw base (fig. 1).

(5) Slowly release compression until riser block and sectors (fig. 1) are firmly gripping cable. Release compression entirely.

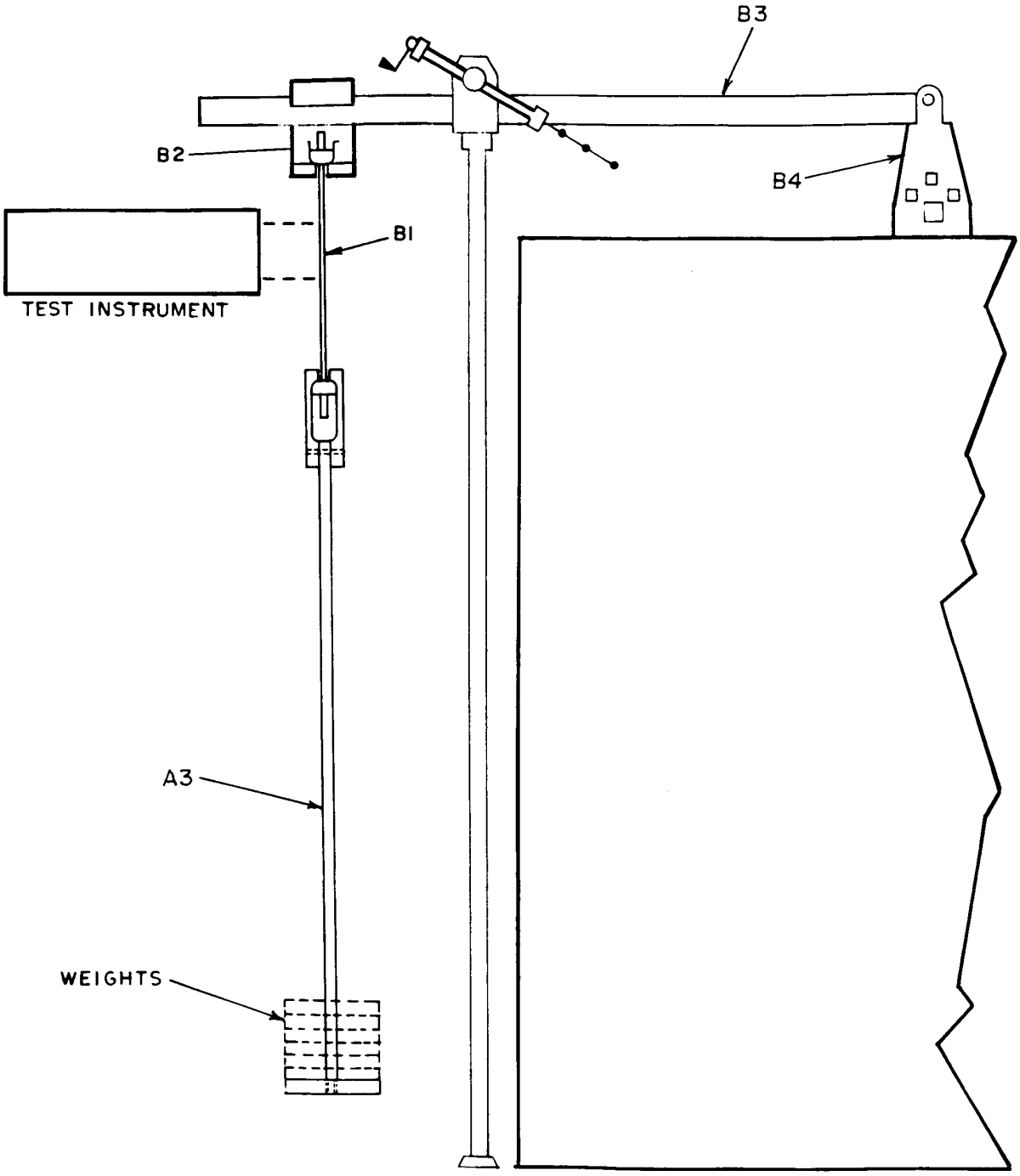

Figure 2. Equipment setup.

NOTE

Do not attempt to take cable tension readings with pointer lock button pressed. This button should only be used to lock dial indicator pointer when taking readings on closely grouped or in awkward or blind locations. When this occurs, button must be pressed to unlock pointer after each reading; otherwise, erroneous readings will be obtained.

(6) TI will indicate between 23.75 and 26.25 pounds.

(7) Reading on TI cable size-gage must correspond with cable size stamped on cable terminal.

(8) Repeat (1) through (7) above, using cables and total weight listed in table 4. TI will indicate within limits specified.

Table 4. Dial Indicating Tensiometer

Cable size (In)	Total weight (Lbs)	Test instrument		
		Cable size	Max	Min
3/32	25	3/32	23.75	26.25
1/8	25	1/8	23.75	26.25
5/32	50	5/32	47.50	52.50
3/16	75	3/16	71.25	78.75
7/32	100	7/32	95.00	105.00
1/4	125	1/4	118.75	131.25
1/4	150	1/4	142.50	157.50
1/4	175	1/4	166.25	183.75

NOTE

Due to the uneven surface of stranded cables a slight variation in reading will sometimes occur on the same cable at the same tension. This is especially true of 5/32-inch diameter cable and larger. To obtain the greatest possible accuracy three to five readings should be taken at slightly different (approximately 1 inch) locations on the cable. Average these readings to obtain the maximum degree of accuracy.

(9) Repeat (1) through (7) above, using cables and total weight as listed in table 4. TI will indicate within limits specified.

NOTE

When measuring tensions, using the $^{7}/_{32}$ and $^{1}/_{4}$-inch size cables, set the dial to [125-] square for tensions of 125 pounds and below and [125+] square for tensions above 125 pounds.

b. Adjustments. No adjustments can be made.

9. Final Procedure

a. Deenergize and disconnect all equipment and reinstall protective cover on TI.

b. When all parameters are within tolerance, annotate and affix DA Label 80 (US Army Calibrated Instrument). When the TI receives limited or special calibration, annotate and affix DA Label 163 (US Army Limited or Special Calibration). When the TI cannot be adjusted within tolerance, repair the TI in accordance with the maintenance manual. When repair is delayed for any reason or the TI cannot be repaired with local resources, annotate and affix DA Form 2417 (US Army Calibration System Rejected Instrument) and inform the owner/user accordingly in accordance with TB 750-25.

TB 9-6635-203-35

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief Of Staff

Official

DON J. DELANDRO
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