

*TB 9-6695-242-24

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR DIAL INDICATING TENSIOMETER DILLON, MODEL AN-ELEX AND DYNAMOMETER, DILLON, MODEL AN-IONO

Headquarters, Department of the Army, Washington, DC
2 November 2006

Distribution Statement A: Approved for public release; distribution is unlimited.

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can improve this manual. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commander, US Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you. You may also provide DA Form 2028 information to AMCOM via e-mail, fax, or the World Wide Web. Our FAX number is: DSN 788-6546 or Commercial 256-842-6546. Our e-mail address is: 2028@redstone.army.mil. Instructions for sending an electronic 2028 may be found at the back of this manual. For the World Wide Web, use: <https://amcom2028.redstone.army.mil>.

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*This bulletin supersedes TB 9-6695-242-35, 6 August 1990, including all changes.

**SECTION I
IDENTIFICATION AND DESCRIPTION**

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Dial Indicating Tensiometer, Dillon, Model AN-ELEX and Dynamometer, Dillon, Model AN-IONO. The manufacturers' manuals 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. Some TIs have a 5 inch dial and some have a 10-inch dial. Other variations are described in text.

b. Time and Technique. The time required for this calibration is approximately 2 hours, using the physical technique.

2. Forms, Records, and Reports

a. Forms records, and reports required for calibration personnel at all levels are prescribed by TB 750-25.

b. Adjustments to be reported are designated (R) at the end of the sentence in which they appear. When adjustments are in tables, the (R) follows the designated adjustment. Report only those adjustments made and designated with (R).

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
Force, Dillon, Model AN-IONO	Capacity: 1 to 20,000 lbs Accuracy: $\pm 2\%$ FS
Force, Dillon, Model AN-ELEX	Capacity: 0 to 15,000 lbs Accuracy: $\pm 3\%$ FS

**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. 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 required for this calibration are common usage accessories issued as indicated in paragraph 4 above, and are not listed in this calibration procedure.

Table 2. Minimum Specifications of Equipment Required

Common name	Minimum use specifications	Manufacturer and model (part number)
LOAD CELL INDICATOR	Range: 175 to 20,400 lbs Accuracy: $\pm 0.05\%$ of reading	HBM, Model MGCplus (13589298)
LOAD CELL ¹	Range: 900 to 20,400 lbs Accuracy: $\pm 0.25\%$ FS	Revere Corporation, USP1-20B (MIS-26331TY3)

¹Limited deployment item.

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 as listed in table 2.

c. 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 some models of the TI are included in this procedure. Additional maintenance information is contained in the manufacturer's manual for this TI.

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

7. Equipment Setup

WARNING

HIGH VOLTAGE is used or exposed during the performance of this calibration. DEATH ON CONTACT may result if personnel fail to observe safety precautions. REDUCE OUTPUT(S) to minimum after each step within the performance check where applicable.

- a.** Visually inspect TI for any damage that will affect measuring accuracy.
- b.** Check that TI clevis pivots freely and easily on shackle.
- c.** Tighten two locking screws on back of TI.

CAUTION

Locking screws must be tight to prevent damage to gage movement.

- d.** Adjust zero-adjusting screw (located in slot on side of TI) until pointer indicates zero.

NOTE

Tap face of TI lightly with finger while zero checking and before making a reading.

NOTE

Turn zero-adjusting screw in direction that will return pointer to zero through least degree of travel.

- e. Connect equipment as shown in figure 1.
- f. Connect load cell indicator to 115 V ac power source. Energize equipment and allow unit to warm up for 30 minutes.
- g. Position controls on load cell indicator as appropriate for load cell to be utilized with TI.
- h. Exercise load cell and TI as described in (1) through (5) below:

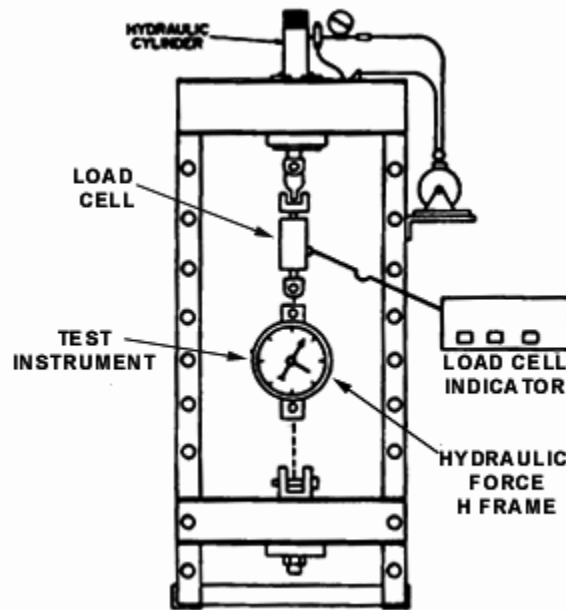


Figure 1. Dynamometer accuracy - equipment setup.

CAUTION

Do not exceed capacity load on either TI or bad cell.

- (1) Apply tension (force) slowly to load cell and TI to obtain an approximate capacity load.
- (2) Release tension on load cell and TI to obtain an approximate zero indication on load cell indicator.
- (3) Repeat (1) and (2) above two more times.
- (4) Verify that TI indicates zero.

(5) Zero load cell indicator.

8. Range and Accuracy

a. Performance Check. Slowly apply tension (force) for TI indications listed in applicable table 3 or 4.

NOTE

Final value of tension must be approached using increasing values. If desired point is overshoot, decrease tension several hundred pounds and again increase tension to desired point.

Table 3. Accuracy for Dillon, Model AN-ELEX

Test instrument indications (Lbs)	Load cell indicator indications (Lbs)	
	Min	Max
3000	2550	3450
4000	3550	4450
5000	4550	5450
6000	5550	6450
7000	6550	7450
8000	7550	8450
9000	8550	9450
10,000	9550	10,450
11,000	10,550	11,450
12,000	11,550	12,450
13,000	12,500	13,450
14,000	13,500	14,450
15,500	14,550	15,450

Table 4. Accuracy for Dillon, Model AN-IONO

Test instrument indications (Lbs)	Load cell indicator indications (Lbs)	
	Min	Max
2000	1600	2400
4000	3600	4400
6000	5600	6400
8000	7600	8400
10,000	9600	10,400
12,000	11,600	12,400
14,000	13,600	14,400
16,000	15,600	16,400
18,000	17,600	18,400
20,000	19,600	20,400

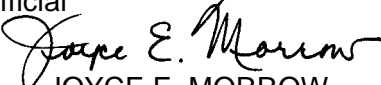
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- b. Adjustments.** No adjustments can be made.

9. Final Procedure

- a.** Deenergize and disconnect all equipment.
- b.** Annotate and affix DA label/form in accordance with TB 750-25.

By Order of the Secretary of the Army:

Official

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Secretary of the Army*

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Distribution:

To be distributed in accordance with the initial distribution number (IDN) 342307, requirements for calibration procedure TB 9-6695-242-24.

Instructions for Submitting an Electronic 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however, only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" whomever@redstone.army.mil
To: <2028@redstone.army.mil

Subject: DA Form 2028

1. **From:** Joe Smith
2. **Unit:** home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** MO
6. **Zip:** 77777
7. **Date Sent:** 19-OCT-93
8. **Pub no:** 55-2840-229-23
9. **Pub Title:** TM
10. **Publication Date:** 04-JUL-85
11. **Change Number:** 7
12. **Submitter Rank:** MSG
13. **Submitter FName:** Joe
14. **Submitter MName:** T
15. **Submitter LName:** Smith
16. **Submitter Phone:** 123-123-1234
17. **Problem:** 1
18. **Page:** 2
19. **Paragraph:** 3
20. **Line:** 4
21. **NSN:** 5
22. **Reference:** 6
23. **Figure:** 7
24. **Table:** 8
25. **Item:** 9
26. **Total:** 123
27. **Text**

This is the text for the problem below line 27.

