*TB 9-5210-213-40

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR PRECISION LEVEL STARRETT MODEL 199

Headquarters, Department of the Army, Washington, DC
12 June 2008

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, U.S. 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 send in your comments electronically to our E-mail address: 2028@redstone.army.mil or by fax 256-842-6546/DSN 788-6546. For the World Wide Web use: https://amcom2028.redstone.army.mil. Instructions for sending an electronic 2028 can be found at the back of this manual.

*This bulletin supersedes TB 9-5210-213-50, dated 23 May 2003.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Precision Level, Starrett Model 199. The manufacturer's manual and Commercial Item Description A-A-50685 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. None.

b. Time and Technique. The time required for this calibration is approximately 1 hour, 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
Precision level	Range: 0.0015 inch per 12 inches Sensitivity: 0.0005 inch per 12 inches

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 NSN 4931-00-621-7878. 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 the TI. Where the four-to-one ratio cannot be met, the four-to-one accuracy of the equipment selected is shown in parenthesis.

5. Accessories Required. The accessories required for this calibration are common usage accessories issued as indicated in paragraph **4** above and are used in this calibration procedure.

Table 2. Minimum Specifications of Equipment Required

Common name	Minimum use specifications	Manufacturer and model (part number)
SURFACE PLATE	Accuracy: ±0.0001 in. Grade AA	18" x 24" (7900123)

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. 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

a. Remove equipment from their cases.

b. Carefully examine all machined surfaces for nicks, burrs, and any other signs of damage and deburr as needed.

c. Ensure that all machined surfaces are clean.

8. Adjustable Level Vial

NOTE

Allow bubble to settle 15 seconds before taking a reading.

NOTE

Make certain no one is propping or leaning on the surface plate.

a. Performance Check

(1) Place TI on surface plate and against a parallel bar that has been clamped to the clamping ledge of the surface plate, this will ensure repeatable observations.

(2) Note the reading, and rotate the TI 180°.

(3) If this reading is not the same magnitude and direction as the first reading, perform **b** below.

(4) If the two readings are the same magnitude and direction, then the surface plate is out of level. Bring the surface plate into a level condition by removing half the error as

observed on the TI vial with the surface plate leveling screws. Rotate the TI 180° and again remove one half the error with the surface plate leveling screws. Repeat this technique till no further improvement can be seen.

(5) When the TI can be rotated 180° and there is no apparent change in the position of the bubble and it is in the center area of the vial, the TI is correctly adjusted.

b. Adjustments

(1) Rotate the TI so that it indicates the greatest error in magnitude and remove the screw dust cover from over the main vial adjustment screw.

(2) Adjust the vial with this screw to remove one half the difference between the two readings. Again rotate the TI 180° and note the reading; then, rotate TI again and remove one half the difference with the vial adjustment screw. Repeat this technique until no further improvement can be seen then proceed to **8 a** (4) above.

9. Final Procedure

a. Replace dust cap over vial adjustment screw.

b. Annotate and affix DA label/form in accordance with TB 750-25.

TB 9-5210-213-40

By Order of the Secretary of the Army:

Official:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army

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Distribution:

To be distributed in accordance with STD IDS No. RLC-1500, 2 January 2003, requirements for calibration procedure TB 9-5210-213-40.

THESE ARE THE INSTRUCTIONS FOR SENDING 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@avma27.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**: TB 9-6625-xxxx-35
9. **Pub Title**: Calibration Procedure for …
10. **Publication Date**:
11. Change Number:
12. **Submitted Rank**: MSG
13. **Sumitter 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.