*TB 9-6680-287-35

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR ELECTRIC TACHOMETER GENERATOR, IDEAL INDUSTRIES, MODEL 50-002

Headquarters, Department of the Army, Washington, DC
24 July 1985

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*This bulletin supersedes TB 9-6680-287-50, 19 June 1972.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Electric Tachometer Generator, Ideal Industries, Model 50-002. The manufacturer's manual was used as the prime data source in compiling these instructions. The equipment being calibrated will be referred to as the TI (test instrument) throughout this bulletin.

a. Model Variations. Variations among models are indicated in the text.

b. Time and Technique. The time required for this calibration is approximately I hour, using the dc and low frequency technique.

2. DA Form 2416 (Calibration Data Card)

a. 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.

b. Adjustments to be reported on DA Form 2416 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
Low-range scale	Range: 0 to 2500 rpm Accuracy: ±1% FS
High-range scale	Range: 0 to 5000 rpm Accuracy: ±1% 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-286. 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	FREQUENCY COUNTER	Range: 59.406 to 12.1212 ms Accuracy: ±0.25%	Hewlett-Packard Model 5345A (MIS-28754/1 Type 1) w/5355A and K87-59992A

Table 3. Accessories Required

Item	Common name	Description (part number)
B1	MOTIONAL TRANSDUCER	(7913463)
B2	TACHOMETER CALIBRATOR	Stewart-Warner Models, 650A or 650H, ST1-650H-1, (7910009)

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.

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.

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 accessories from carrying case.

b. Insert generator unit into meter unit and twist generator unit cw to lock into position.

c. Mechanically zero meter, if necessary, using mechanical zero adjustment screw.

d. Turn drive shaft of generator manually to insure that shaft turns freely.

e. Remove four back cover securing screws from tachometer calibrator (B2). Remove back cover.

f. Connect motional transducer (B1) output to input of frequency counter (A1).

g. Connect frequency counter and power supply (part of B2) to a 115-V ac source.

h. Energize equipment and allow 15 minutes for equipment to warm-up and stabilize.

i. Connect 0.500 to 1 ratio drive adapter, supplied with tachometer calibrator, to tachometer calibrator with calibrator in the horizontal plane.

NOTE

Observe that flywheel in tachometer calibrator is painted alternately black and white; model 650A, 10 equal black and white; model 650H, one each black and white. If model 650H is used, all frequencies listed will be divided by 10.

8. Rpm Accuracy

a. Performance Check

(1) Set RANGE switch of TI to LO.

(2) Install conical tip into center hole of generator unit drive shaft of TI.

(3) Hold TI in horizontal position and insert conical tip into drive of tachometer calibrator (B2), applying only enough pressure to turn conical tip without slippage.

NOTE

Changing the applied pressure may affect frequency indication.

(4) Adjust tachometer calibrator for 500 rpm as indicated on TI. Frequency counter (A1) will indicate technique of between 57.143 and 63.171 ms.

(5) Repeat technique of (3) and (4) above, using the ratio adapters listed in table 4. If frequency counter does not indicate within limits specified, perform **b** below.

Table 4. Rpm Accuracy

Test instrument (rpm)		Frequency counter indications (ms)	
0.500:1 Adapter	1:1 Adapter	Min	Max
- - -	1000	57.143	63.170
1000	2000	29.269	30.769
1500	3000	19.672	20.339
2000	4000	14.815	15.1906
2500	5000	11.882	12.1212

(6) Set RANGE switch of TI to HI.

(7) Repeat (5) above with 1 to 1 ratio adapter.

(8) Repeat (5) and (7) above with ratio adapters connected to tachometer calibrator in a vertical plane.

b. Adjustments

(1) Repeat **7i** through **8a**(3) above.

(2) Adjust tachometer calibrator for 12.005 ms on frequency counter.

(3) Adjust low range adjustment (fig. 1) f or 2500 rpm on TI (R).

(4) Set RANGE switch of TI to HI.

(5) Connect 1 to 1 ratio drive adapter to tachometer calibrator in a horizontal plane.

(6) Adjust tachometer calibrator for 12.005 ms on frequency counter.

(7) Adjust high range adjustment (fig. 1) for 5000 rpm on TI (R).

(8) Repeat **7i** through **8a**(8) above.

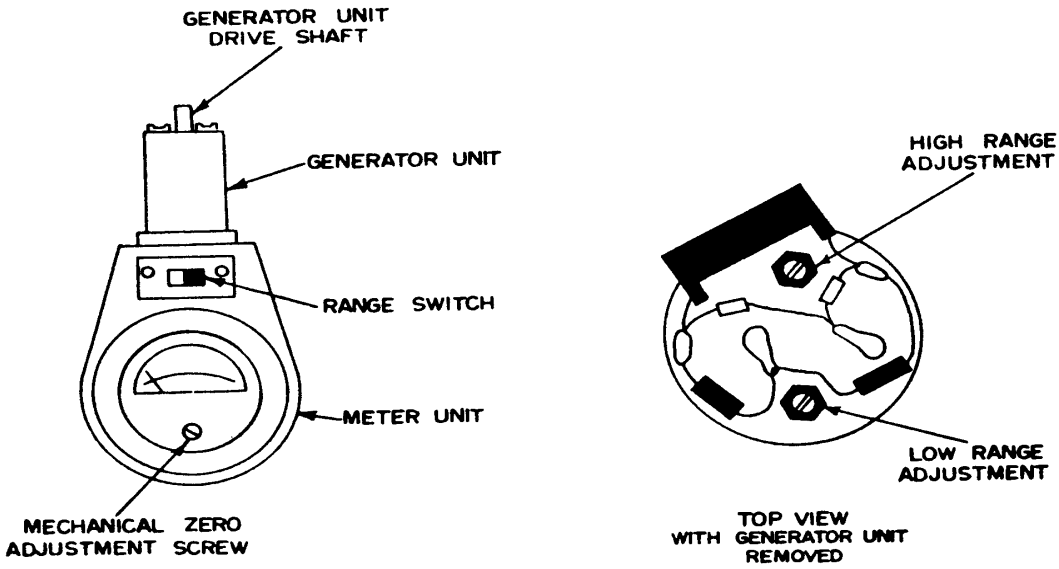

Figure 1. Electric tachometer - generator.

9. Final Procedure

a. Deenergize and disconnect all equipment.

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.

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