TB 9-4920-361-35

CHANGE 5

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR VERTICAL DISPLAY SYSTEM LINE TEST SET, CANADIAN MARCONI, MODEL 476-853, AND VERTICAL DISPLAY SYSTEM BENCH TEST SET, CANADIAN MARCONI, MODEL 476-854

Headquarters, Department of the Army, Washington, DC
11 September 2001

TB 9-4920-361-35, 20 February 1984, is changed as follows:

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7 and 8	7 and 8

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By Order of the Secretary of the Army:

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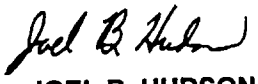

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CALIBRATION PROCEDURE FOR VERTICAL DISPLAY SYSTEM LINE TEST SET, CANADIAN MARCONI, MODEL 476-853, AND VERTICAL DISPLAY SYSTEM BENCH TEST SET, CANADIAN MARCONI, MODEL 476-854

Headquarters, Department of the Army, Washington, DC
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Headquarters, Department of the Army, Washington, DC
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CALIBRATION PROCEDURE FOR VERTICAL DISPLAY SYSTEM LINE TEST SET, CANADIAN MARCONI, MODEL 476-853, AND VERTICAL DISPLAY SYSTEM BENCH TEST SET, CANADIAN MARCONI, MODEL 476-854

Headquarters, Department of the Army, Washington, DC
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17 and 18	17 and 18

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TB 9-4920-361-35

Change 1

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR VERTICAL DISPLAY SYSTEM LINE TEST SET, CANADIAN MARCONI, MODEL 476-853, AND VERTICAL DISPLAY SYSTEM BENCH TEST SET, CANADIAN MARCONI, MODEL 476-854

Headquarters, Department of the Army, Washington, DC
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DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR VERTICAL DISPLAY SYSTEM LINE TEST SET, CANADIAN MARCONI, MODEL 476-853 AND VERTICAL DISPLAY SYSTEM BENCH TEST SET, CANADIAN MARCONI, MODEL 476-854

Headquarters, Department of the Army, Washington, DC
20 February 1984

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REPORTING OF ERRORS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedure, please let us know. Mail your letter or DA Form 2028 to: Commander, U. S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5230. A reply will be furnished to you. You may also send in your comments electronically to our e-mail address: ls-lp@redstone.army.mil or FAX 256-842-6546/DSN 788-6546.

*This bulletin supersedes TB 9-4920-361-35 30 August 1983.

SECTION I
IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Vertical Display System Line Test Set, Canadian Marconi, Model 476-853 and Vertical Display System Bench Test Set, Canadian Marconi, Model 476-854. TM 55-4920-412-13&P and TM 55-4920-413-12 & P 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. Model 476-854 contains a simulator and a unit tester. Model 476-853 contains only a simulator.

b. Time and Technique. The time required for this calibration is approximately 3 hours, 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
Torque No. 1 and No. 2 (simulator)	Fixed: 0 and 3.7 V dc Accuracy: ±0.10 V dc Variable: 0 ±0.10 to 5.42 V dc min
Fuel quantity No. 1 and No. 2 (simulator)	Fixed: 0 and 6.13 V dc Accuracy: ±0.05 V dc Variable: 0 ±0.10 to 7.73 V dc min
Turbine gas temp No. 1 and No. 2 (simulator)	Fixed: 0 and 33.80 mV dc Accuracy: ±0.10 mV dc Variable: 0 ±0.01 to 44.00 mV dc min
Engine oil temp No. 1 and No. 2 (simulator)	Fixed: 74 and 151 ohms Accuracy: ±3 ohms Variable: 77 to 148 ohms min
Xmsn oil temp (simulator)	Fixed: 85 and 230 ohms Accuracy: ±6 ohms Variable: 88 to 270 ohms min
Rotor speed (simulator)	Fixed: 0 and 11,250 Hz Accuracy: ±56 Hz Variable: 0 to 17,200 Hz min
Engine % rpm No. 1 and No. 2 (simulator)	Fixed: 0 and 1333.5 Hz Accuracy: ±6 Hz Variable: 0 to 1830 Hz min
Gas gen speed No. 1 and No. 2 (simulator)	Fixed: 0 and 2135 Hz Accuracy: ±10 Hz Variable: 0 to 2400 Hz min
Engine oil press No. 1 and No. 2 (simulator)	Fixed: 3.591 and 2.914 V ac Accuracy: ±0.144 V ac Variable: 3.447 to 2.770 V ac min
Xmsn oil press (simulator)	Fixed: 2.840 and 3.591 V ac Accuracy: ±0.144 V ac Variable: 3.447 to 2.696 V ac min
Inter cal(unit tester): Positions 1 to 14 Positions 15 to 19	 Range: 5 V dc Accuracy: ±1 V dc Range: 5 V dc Accuracy: ±0.5 V dc
Rotor overspeed (unit tester)	Range: 5 V dc Accuracy: ±0.5 V dc
Central display and signal data (unit tester)	See paragraph 21
Display update (unit tester)	See paragraph 22

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	AUTOTRANSFORMER	Range: 105 to 125 V ac at 400 Hz Accuracy: ±1%	General Radio, Model W10MT3AS3 (7910809)
A2	DC POWER SUPPLY	Range: 28 V dc Accuracy: ±1%	NJE, Model CS36CR30D2 (7907346-2)
A3	DIGITAL VOLTMETER	Range: -11 to +28 v dc, 1.32 to 12.5 V ac Accuracy: ±0.8% dc, ±1% ac Range: 71 to 270Ω Accuracy: ±0.5%	Hewlett-Packard, Model 3490AOPT060 (3490AOPT060)
A4	FREQUENCY COUNTER	Range: 600 ms to 17.2 kHz Accuracy: ±0.4%	Hewlett-Packard, Model 5345A (MIS-28754-1 Type 1)
A5	OSCILLOSCOPE	Range: 1.5 to 6 V p-p Accuracy: ±3%	Tektronix, Type R5440 (MIS-28706/1 Type 1) w/5A48 (MIS-28706/3) and 5B42 (MIS-28706/4)
A6	PRECISION OSCILLATOR	Range: 6 V at 800 Hz	Krohn-Hite, Model 4100AR-8 (7915951) w/7500 (7500)

Table 3. Accessories Required

Item	Common name (official nomenclature)	Description (part number)
B1	ADAPTER[1]	BNC plug to double banana jacks (7907401)
B2	ADAPTER	Single banana jack to pin plug (black) (7907528)
B3	ADAPTER BOX	BAN jack terminations (7916113) (SKD4850-3)
B4	EXTENDER BOARD	Canadian Marconi P/N 220-419916-000
B5	LEAD	24-in., No. 18; single banana plug terminations (red) (7907497)
B6	LEAD[1]	24-in., No. 18; single banana plug terminations (black(7907498)
B7	LEAD[3]	Pin jack to single banana plug (7921032)
B8	LEAD[1]	32-in., single banana plug to test hook (red) (7915941-1)
B9	LEAD	2 single banana plugs to ac power plug (7907551)

[1]Two required.

[2] Furnished with TI.
[3] Five required.

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.

c. Perform paragraphs **8** through **24** for model 476-854 and paragraphs **8** through **18**, **23**, and **24** for model 476-853.

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 me, 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 TM 55-4920-412-13&P for model 476-854 and TM 55-4920-413-12&P for model 476-853.

NOTE

When indications specified in paragraphs 8 through 22 are not within tolerance, perform the power supply check prior to making adjustments. After adjustments are made, repeat paragraphs 8 through 22 . Do not perform power supply check if all other parameters are within tolerance.

NOTE

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

7. Equipment Setup

a. If calibrating TI model 476-854, do not connect unit tester to simulator unit until instructed to do so.

b. Set ON-OFF-SIM ONLY switch to OFF.

c. Connect equipment as shown in figure 1.

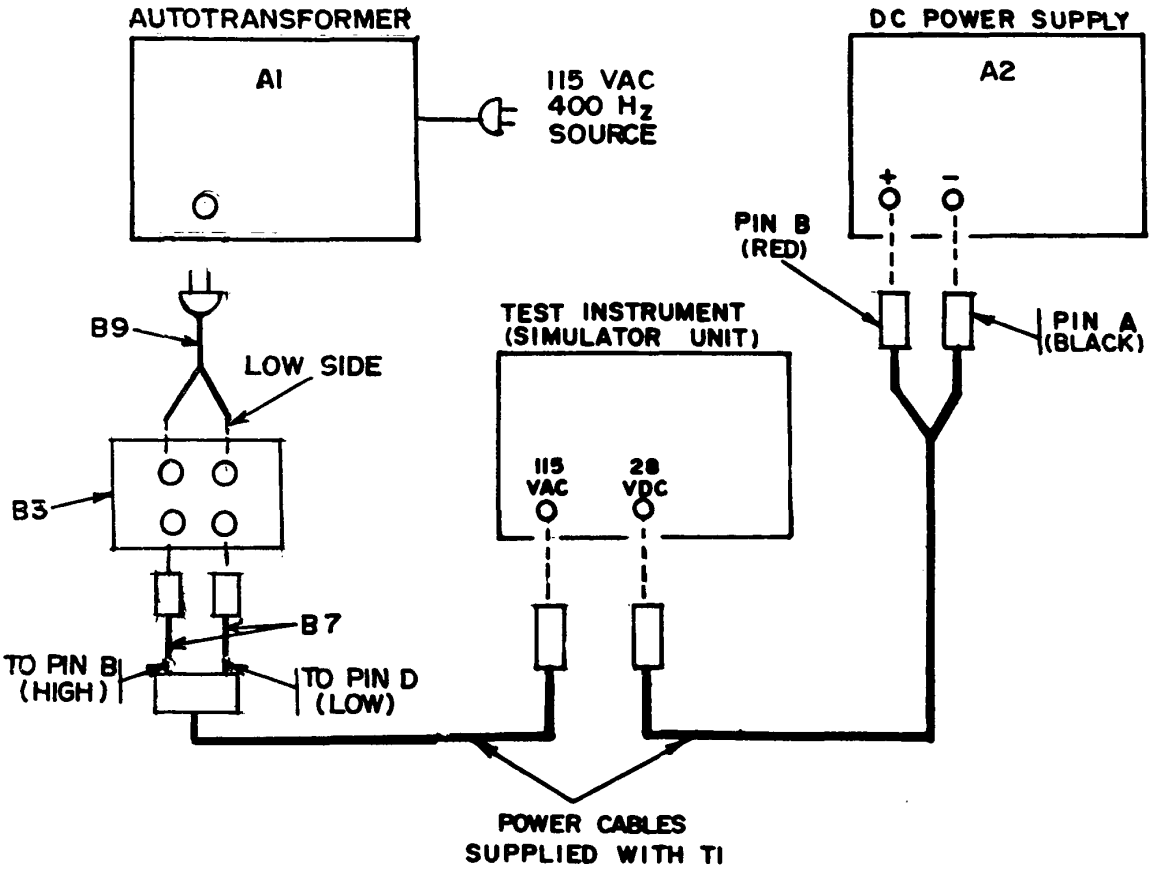

Figure 1. Power supply - equipment setup.

d. Adjust autotransformer (A1) output for 115 V.

e. Connect digital voltmeter (A3) to dc power supply (A2), using leads (B5 and B6), and adjust dc power supply for a 28-V output indication on digital voltmeter.

f. Disconnect digital voltmeter from equipment setup.

g. Set ON-OFF-SIM ONLY switch to ON and allow at least 30 minutes for warm-up.

h. Set ON-OFF-SIM ONLY switch to OFF.

CAUTION

To prevent damage to TI, always turn power off before making connections.

8. Output Voltages

a. Performance Check

(1) Connect digital voltmeter (A3) between No. 1 pins HH (LOW) and FF (HI), using two leads (B7). Refer to figure 2 for pin locations.

(2) Set ON-OFF-SIM ONLY switch to SIM ONLY and INTEGRAL LIGHTING TO INT. Digital voltmeter will indicate between 4.0 and 6.0 V ac.

(3) Set ON-OFF-SIM ONLY switch to OFF.

(4) Connect digital voltmeter between No. 1 pins EE (LOW) and P (HI).

(5) Set ON-OFF-SIM ONLY switch to ON. If digital voltmeter does not indicate between 11.5 and 12.5 V dc, perform **b** below.

(6) Set ON-OFF-SIM ONLY switch to OFF.

(7) Connect digital voltmeter between No. 1 EE (LOW) and y (HI).

(8) Set ON-OFF-SIM ONLY switch to ON. If digital voltmeter does not indicate between -11.5 and -12.5 V dc, perform **b** below.

(9) Set ON-OFF-SIM ONLY switch to OFF.

(10) Connect digital voltmeter between No. 1 pins EE (LOW) and J (HI).

(11) Set ON-OFF-SIM ONLY switch to ON. Digital voltmeter will indicate between 5 and 6 V dc.

(12) Set ON-OFF-SIM ONLY switch to OFF.

b. Adjustments. Perform paragraph 23.

9. Torque No. 1 and No. 2

a. Performance Check

(1) Set ON-OFF-SIM ONLY switch to OFF.

(2) Connect digital voltmeter (A3) to TI connector No. 1 pins E (HI) and F (LOW), using two leads (B7). Refer to figure 2 for pin locations.

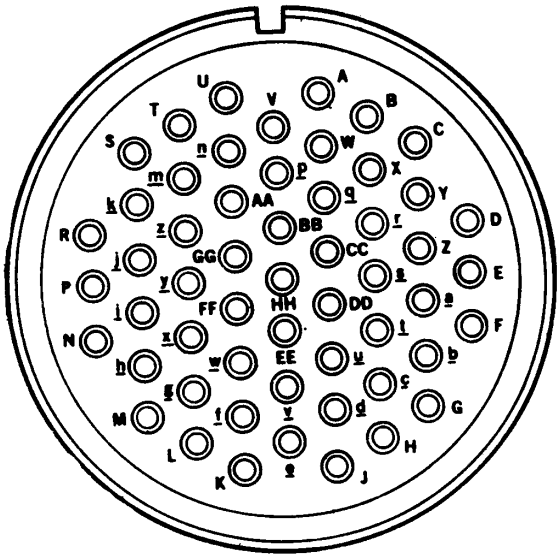

Figure 2. Simulator unit - pin locations.

(3) Set TORQUE NO. 1 CAL/NOR switch to CAL and HI/LO switch to HI.

(4) Set ON-OFF-SIM ONLY switch to SIM ONLY. Digital voltmeter will indicate between 3.6 and 3.8 V dc.

(5) Set TORQUE NO. 1 HI/LO switch to LO. Digital voltmeter will indicate between -0.1 and +0.1 V dc.

(6) Set TORQUE NO. 1 CAL/NOR switch to NOR and turn variable control fully ccw. Digital voltmeter will indicate between -0.1 and +0.1 V dc.

(7) Adjust variable control fully cw Digital voltmeter will indicate 5.415 V dc minimum

(8) Set ON-OFF-SIM ONLY switch to OFF.

(9) Disconnect leads from connector No. 1 pins E (HI) and F (LOW) and connect to connector No. 2 pins a (HI) and b (LOW).

(10) Repeat (3) through (8) above, except use TORQUE NO. 2 controls.

b. Adjustments. No adjustments can be made.

10. Fuel Quantity No. 1 and No. 2

a. Performance Check

(1) Connect digital voltmeter (A3) to connector No. 1 pins G (HI) and H (LOW), using two leads (B7).

(2) Set FUEL QUANTITY NO. 1 CAL/NOR switch to CAL and HI/LO switch to HI.

(3) Set ON-OFF-SIM ONLY switch to SIM ONLY. Digital voltmeter will indicate between 6.08 and 6.18 V dc.

(4) Set FUEL QUANTITY NO. 1 HI/LO switch to LO. Digital voltmeter will indicate between -0.1 and +0.1 V dc.

(5) Set FUEL QUANTITY NO. 1 CAL/NOR switch to NOR and adjust variable control fully ccw. Digital voltmeter will indicate between -0.1 and + 0.1 V dc.

(6) Adjust variable control fully cw. Digital voltmeter will indicate 7.63 V dc minimum.

(7) Set ON-OFF-SIM ONLY switch to OFF.

(8) Disconnect leads from TI connector No. 1 pins G (HI) and H (LOW) and connect to connector No. 2 pins G (HI) and H (LOW) -

(9) Repeat (2) through (7) above, except use FUEL QUANTITY NO. 2 controls.

b. Adjustments. No adjustments can be made.

11. Turbine Gas Temp No. 1 and No. 2

a. Performance Check

(1) Connect digital voltmeter (A3) to connector No. 1 pins L (HI) and M (LOW), using two leads (B7).

(2) Set TURBINE GAS TEMP NO. 1 CAL/NOR switch to CAL and HI/LO switch to HI.

(3) Set ON-OFF-SIM ONLY switch to SIM ONLY. Digital voltmeter will indicate between 33.65 and 33.95 mV dc.

(4) Set TURBINE GAS TEMP NO. 1 HI/LO switch to LO. Digital voltmeter will indicate between -0.50 and +0.50 mV dc.

(5) Set TURBINE GAS TEMP NO. CAL/NOR switch to NOR and adjust variable control fully ccw. Digital voltmeter will indicate between -0.50 and +0.50 mV dc.

(6) Adjust variable control fully cw Digital. voltmeter will indicate 41.3 mV dc minimum.

(7) Set ON-OFF-SIM ONLY switch TO OFF.

(8) Disconnect leads from connector No. 1 pins L (HI) and M (LOW) and connect to connector No. 2 pins L (HI) and M (LOW).

(9) Repeat (2) through (7) above except use TURBINE GAS TEMP NO. controls.

b. Adjustments. No adjustments can be made.

12. Engine Oil Temp No. 1 and No. 2

a. Performance Check

(1) Connect digital voltmeter (A3) to connector No. 1 pins g (HI) and h (LOW), using two leads (B7).

(2) Set ENGINE OIL TEMP NO. 1 CAL/NOR switch to CAL and HI/LO switch to HI.

NOTE

Measure resistance of test leads and subtract from resistance indications.

(3) Measure resistance. Digital voltmeter will indicate between 148 and 154 ohms.

(4) Set ENGINE OIL TEMP NO. 1 HI/LO switch to LO. Digital voltmeter will indicate between 71 and 77 ohms.

(5) Set ENGINE OIL TEMP NO. 1 CAL/NOR switch to NOR and adjust variable control from fully ccw to fully cw. Digital voltmeter indication will vary from 77 ohms or less to 148 ohms or more.

(6) Disconnect leads from connector No. 1 pins L(HI) and h (LOW) and connect to connector No. 2 pins g (HI) and h (LOW).

(7) Repeat (2) through (5) above, except use ENGINE OIL TEMP NO. 2 controls.

b. Adjustments. No adjustments can be made.

13. Xmsn Oil Temp

a. Performance Check

(1) Connect digital voltmeter (A3) to connector No. 2 pins J (HI) and K (LOW), using two leads (B7).

(2) Set XMSN OIL TEMP CAL/NOR switch to CAL and HI/LO switch to HI.

NOTE

Measure resistance of test leads and subtract from resistance indications.

(3) Measure resistance. Digital voltmeter will indicate between 224 and 236 ohms.

(4) Set XMSN OIL TEMP HI/LO switch to LO. Digital voltmeter will indicate between 79 and 91 ohms.

(5) Set XMSN OIL TEMP CAL/NOR switch to NOR and adjust variable control from fully ccw to fully cw. Digital voltmeter indication will vary from 88 ohms or less to 270 ohms or more.

b. Adjustments. No adjustments can be made.

14. Rotor Speed

a. Performance Check

(1) Connect frequency counter (A4) to connector No. 1 pins A (HI) and B (LOW), using two leads and adapter (B7 and B1).

(2) Set ROTOR SPEED CAL/NOR switch to CAL and HI/LO switch to HI.

(3) Set ON-OFF-SIM ONLY switch to SIM ONLY.

(4) Measure frequency. Frequency counter will indicate between 11,190 and 11,302 Hz.

(5) Set ROTOR SPEED HI/LO switch to LO. Frequency counter will indicate 0.

(6) Set ROTOR SPEED CAL/NOR to NOR and adjust ROTOR SPEED variable control from fully ccw to fully cw. Frequency counter indication will vary from 0 to 17,200 Hz minimum.

(7) Set ON-OFF-SIM ONLY switch to OFF.

b. Adjustments. No adjustments can be made.

15. Engine % Rpm No. 1 and No. 2

a. Performance Check

(1) Connect frequency counter (A4) to connector No. 1 pins C (HI) and D (LOW), using two leads and adapter (B7 and B1).

(2) Set ENGINE % RPM NO. 1 CAL/NOR switch to CAL and HI/LO switch to HI.

(3) Set ON-OFF-SIM ONLY switch to SIM ONLY. Frequency counter will indicate between 1308 and 1362 Hz.

(4) Set ENGINE % RPM NO. 1 HI/LO switch to LO. Frequency counter will indicate 0.

(5) Set ENGINE % RPM NO. 1 CAL/NOR to NOR and adjust ENGINE % RPM NO. 1 variable control from fully ccw to fully cw. Frequency counter indication will vary from 0 to 1830 Hz minimum.

(6) Set ON-OFF-SIM ONLY switch to OFF.

(7) Disconnect leads from connector No. 1 pins C (HI) and D (LOW) and connect to connector No. 2 pins Y (HI) and Z (LOW).

(8) Repeat (2) through (6) above, except use ENGINE % RPM NO. 2 controls.

b. Adjustments. No adjustments can be made.

16. Gas Speed No. 1 and No. 2

a. Performance Check

(1) Connect frequency counter (A4) to TI connector No. 1 pins c (HI) and d (LOW), using two leads and adapter (B7 and B1).

(2) Set GAS GEN SPEED No. 1 CAL/NOR switch to CAL and HI/LO switch to HI.

(3) Set ON-OFF-SIM ONLY switch to SIM ONLY. Frequency counter will indicate between 2125 and 2145 Hz.

(4) Set GAS GEN SPEED NO. 1 HI/LO switch to LO. Frequency counter will indicate 0.

(5) Set GAS GEN SPEED NO. 1 CAL/NOR switch to NOR and adjust GAS GEN SPEED NO. 1 variable control from fully ccw to fully cw. Frequency counter indication will vary from 0 to 2400 Hz minimum.

(6) Set ON-OFF-SIM ONLY switch to OFF.

(7) Disconnect leads from connector No. 1 pins c (HI) and d (LOW) and connect to connector No. 2 pins c (HI) and d (LOW).

(8) Repeat (2) through (6) above, except use GAS GEN SPEED NO 2 controls.

b. Adjustments. No adjustments can be made.

17. Engine Oil Press No. 1 and No. 2

a. Performance Check

(1) Connect equipment as shown in figure 3, connection A for connector No. 1. Do not disconnect equipment connected in figure 1.

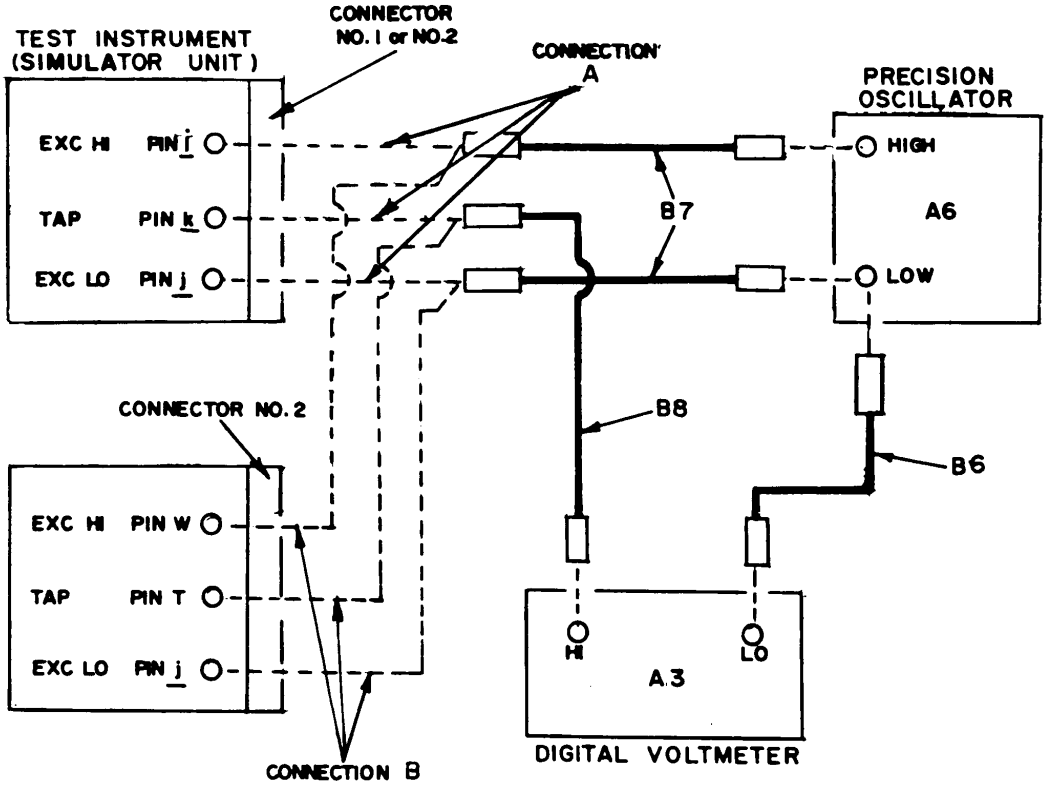

Figure 3. Engine oil pressure - equipment setup.

(2) Set TI ENGINE OIL PRESS NO. 1 CAL/NOR switch to CAL and HI/LO switch to LO.

(3) Set precision oscillator (A6) for a 6-V, 400 Hz output.

(4) Set ON-OFF-SIM ONLY switch to SIM ONLY. If digital voltmeter (A3) does not indicate between 3.447 and 3.735 V ac, perform **b**(1) through (4) below.

(5) Set ENGINE OIL PRESS NO. 1 HI/LO switch to HI. Digital voltmeter will indicate between 2.770 and 3.058 V ac.

(6) Set ENGINE OIL PRESS NO. 1 CAL/NOR switch to NOR and adjust ENGINE OIL PRESS NO. 1 variable control from fully ccw to fully cw. If digital voltmeter does not indicate from more than 3.447 to less than 2.770 V ac, perform **b**(1) through (3) and (5) and (6) below.

(7) Set ON-OFF-SIM ONLY switch to OFF and precision oscillator switch to OFF.

(8) Connect equipment as shown in figure 3, connection A, for connector No. 2.

(9) Repeat (2) through (7) above except use ENGINE OIL PRESS NO. 2 controls. If not within tolerance in (4) above, perform **b**(1) through (3) and (7) below. If not in tolerance in (6) above, perform **b**(1) through (3) and (8) and (9) below.

b. Adjustments

(1) Set autotransformer (A1), dc power supply (A2), and precision oscillator (A6) power to OFF.

(2) Remove pressure board A2 (fig. 4) and reinstall, using extender board (B4).

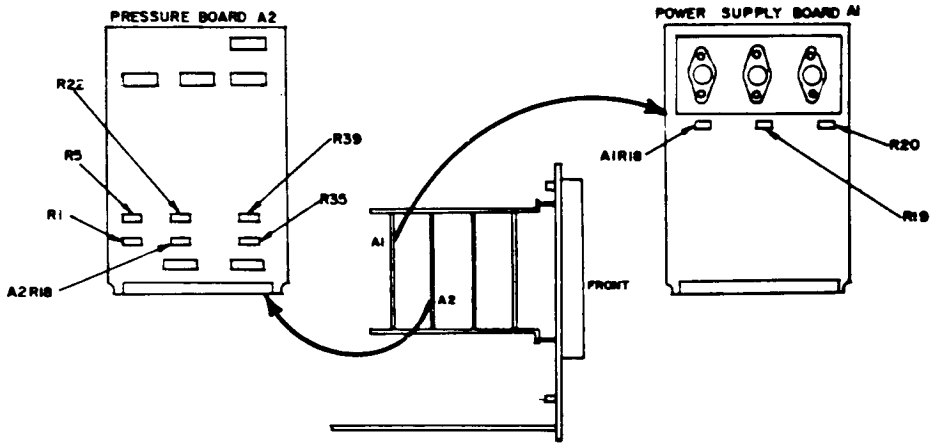

Figure 4. Simulator unit - internal left view.

(3) Set autotransformer dc power supply, and precision oscillator power to ON.

(4) Adjust R5 (fig. 4) for a 3.591-V ac indication on digital voltmeter (R).

(5) Turn ENGINE OIL PRESS NO. 1 variable control fully ccw.

(6) Adjust R1 (fig. 4) for a 3.591-V ac indication on digital voltmeter (R).

(7) Adjust R22 (fig. 4) for a 3.591-V ac indication on digital voltmeter (R).

(8) Turn ENGINE OIL PRESS NO. 2 variable control fully ccw.

(9) Adjust A2R18 (fig. 4) for a 3.591V ac indication on digital voltmeter (R).

18. Xmsn Oil Press

a. Performance Check

(1) Connect equipment as shown in figure 3, connection B, for connector No. 2. Do not disconnect equipment connected in figure 1.

(2) Set XMSN OIL PRESS CAL/NOR switch to CAL and HI/LO switch to LO.

(3) Set precision oscillator (A6) for a 6-V, 400 Hz output.

(4) Set ON-OFF-SIM ONLY switch to SIM ONLY. If digital voltmeter (A3) does not indicate between 3.447 and 3.735 V ac, perform **b** (1) through (4) below.

(5) Set XMSN OIL PRESS HI/LO switch to HI. Digital voltmeter will indicate between 2.696 and 2.984 V ac.

(6) Set XMSN OIL PRESS CAL/NOR switch to NOR and adjust XMSN OIL PRESS variable control from fully ccw to fully cw. If digital voltmeter does not indicate from more than 3.447 to less than 2.696 V ac, perform **b**(1) through (3) and (5) through (7) below.

(7) Set ON-OFF-SIM ONLY switch to OFF.

b. Adjustments

(1) Set autotransformer (A1), dc power supply (A2), and precision oscillator (A6) power to OFF.

(2) Remove pressure board A2 (fig. 4) and reinstall, using extender board (B4).

(3) Set autotransformer, dc power supply, and precision oscillator power to ON.

(4) Adjust R39 (fig. 4) for a 3.591-V ac indication on digital voltmeter (R).

(5) Turn XMSN OIL PRESS variable control fully ccw.

(6) Adjust R35 (fig. 4) for a 3.591-V ac indication on digital voltmeter (R).

(7) Repeat **a**(2) through (6) above and adjust for best in-tolerance condition.

19. Inter Cal (Unit Tester)

NOTE

Do not perform paragraphs 19 through 22 when calibrating model 476-853. Go to paragraph 23.

a. Performance Check

(1) Disconnect precision oscillator (A6) and digital voltmeter (A3) from equipment setup.

(2) Connect simulator INTERCONNECT jack to unit tester J5 INTERCONNECT jack, using cable (219-419742-000, supplied with TI).

NOTE

Using cable supplied with TI connecting it to appropriate jack being tested, while performing paragraphs 19 through 22 (tables 4, 5, and 6) and using opposite end of cable to complete test may prevent possible damage to connectors on TI.

(3) Connect digital voltmeter to unit tester connector J8 pin 17 (HI) and COM test point, using leads and adapter (B5, B7, and B2).

(4) Set INTER CAL SELECT switch to 1.

(5) Set ON-OFF-SIM ONLY switch to ON. Digital voltmeter will indicate between 4 and 6 V dc.

(6) Set ON-OFF-SIM ONLY switch to OFF.

(7) Repeat technique of (3) through (6) above for INTER CAL SELECT switch positions and pin connections listed in table 4. Digital voltmeter will indicate within limits specified. Refer to figure 5 for pin locations on J2, J3, and J9.

(8) Set ON-OFF-SIM ONLY switch to ON.

(9) Set INTER CAL SELECT switch to 21 and ANALOG SET switch to SLOW and then to FAST while observing analog INTERFACE MONITOR which will count at a faster rate and reset after counting to 1830.

(10) Set INTER CAL SELECT and ON-OFF-SIM ONLY switches to OFF.

Table 4. Inter Cal Select (Unit Tester)

Unit tester		Digital voltmeter indications (V dc)	
INTER CAL SELECT switch position no.	Pin connections	Min	Max
2	J8 Pin 19	4	6
3	J8 Pin 18	4	6
4	J8 Pin 20	4	6
5	J8 Pin 21	4	6
6	J9 Pin 44	4	6
7	J9 Pin 45	4	6
8	J9 Pin 46	4	6
9	J9 Pin 47	4	6
10	J9 Pin 22	4	6
11	J9 Pin 23	4	6
12	J9 Pin 48	4	6
13	J9 Pin 49	4	6
14	J9 Pin 50	4	6
15	J2 Pin 41	4.5	5.5
16	J3 Pin 41	4.5	5.5
17	J3 Pin 42	4.5	5.5
18	J3 Pin 40	4.5	5.5
19	J2 Pin 43	4.5	5.5

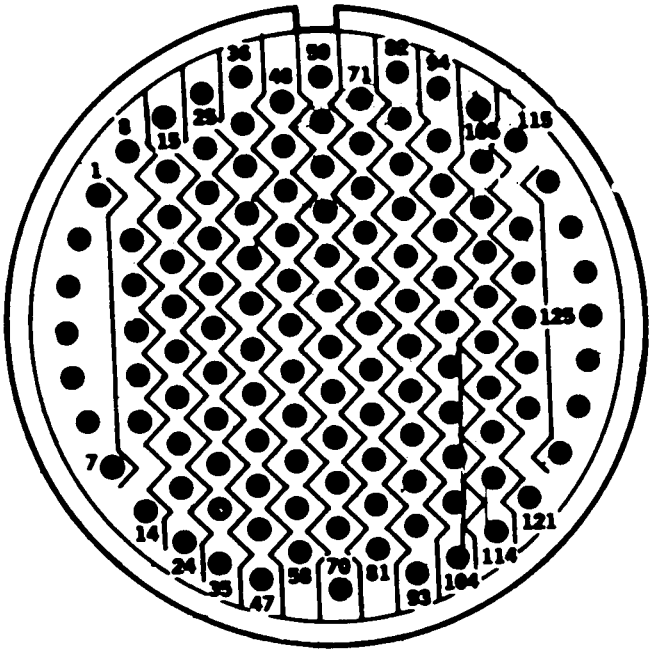

Figure 5. Unit tester - pin locations.

b. Adjustments. No adjustments can be made.

20. Rotor Overspeed (Unit Tester)

a. Performance Check

(1) Disconnect lead from J2 pin 43 and connect to J6 pin 31 on unit tester.

(2) Set ROTOR OVERSPEED 127% switch to ON.

(3) Set ON-OFF-SIM ONLY switch to ON. Digital voltmeter (A3) will indicate between 4.5 and 5.5 V dc.

(4) Set ROTOR OVERSPEED 127% and ON-OFF-SIM ONLY switches to OFF.

(5) Disconnect lead from J6 pin 31 and connect to J6 pin 32.

(6) Repeat (2) through (4) above, except use ROTOR OVERSPEED 137% switch.

(7) Disconnect lead from J6 pin 32 and connect to J6 pin 33.

(8) Repeat (2) through (4) above, except use ROTOR OVERSPEED 142% switch.

b. Adjustments. No adjustments can be made.

21. Central Display and Signal Data (Unit Tester)

a. Performance Check

(1) Disconnect lead from J6 pin 33 and connect to J2 pin 1 on unit tester.

(2) Set LOGIC P/S switch to 1.

(3) Set ON-OFF-SIM ONLY switch to ON. Digital voltmeter (A3) will indicate between 13 and 17 V dc.

(4) Set ON-OFF-SIM ONLY switch to OFF.

(5) Repeat technique of (1) through (4) above at unit tester switch settings and pin connections listed in table 5. Digital voltmeter will indicate within limits specified.

(6) Disconnect digital voltmeter from equipment setup.

(7) Connect J3 pin 26 to J3 pin 27, using two leads (B7).

(8) Connect digital voltmeter positive to J3 pin 93 and negative to J3 pin 26, using two leads (B7).

Table 5. Central Display and Signal Data

Unit tester		Digital voltmeter indications (V dc)	
Logic P/S switch settings	Pin connections	Min	Max
1	J2 Pin 3	-13.0	-17.0
1	J2 Pin 5	6.5	9.5
1	J2 Pin 6	6.5	9.5
1	J2 Pin 35	4.5	5.5
2	J3 Pin 1	13.0	17.0
2	J3 Pin 3	-13.0	-17.0
2	J3 Pin 5	6.5	9.5
2	J3 Pin 6	6.5	9.5
2	J3 Pin 35	4.5	5.5
1	J6 Pin 26	10.0	11.0
1	J6 Pin 27	-10.0	-11.0
- - -	J6 Pin 16	4.0	6.0
- - -	J6 Pin 29	4.0	6.0
- - -	J8 Pin 13	4.0	6.0
- - -	J8 Pin 16	4.0	6.0
1	J9 Pin 2	13.0	17.5
1	J9 Pin 4	-13.5	-17.5
1	J9 Pin 7	6.5	9.5
PILOTS control fully cw	J1 Pin 4	4.5	5.5
COPILOTS control fully cw	J4 Pin 4	4.5	5.5
CLOCK INHIBIT to ANA	J8 Pin 24	4.0	6.0
P/S CONTROL fully cw	J9 Pin 19	4.0	6.0
CLOCK INHIBIT to DIG	J8 Pin 25	4.0	6.0
CLOCK INHIBIT to DIG	J9 Pin 36	4.0	6.0
- - -	J9 Pin 35	4.5	5.5
CLOCK INHIBIT to ANA	J9 Pin 37	4.0	6.0
PILOTS control fully cw	AD/P test point	4.5	5.5
1 P/S CONTROL fully cw and PS CONT to REMOTE	IL/S test point	4.5	5.5

(9) Set ON-OFF-SIM ONLY switch to ON. Digital voltmeter will indicate between 7.5 and 12.5 V ac.

(10) Set ON-OFF-SIM ONLY switch to OFF.

b. Adjustments. No adjustments can be made.

22. Display Update (Unit Tester)

a. Performance Check

(1) Connect equipment as shown in figure 6. Do not disconnect equipment connected in figure 1.

(2) Set DISPLAY UPDATE switch to ON.

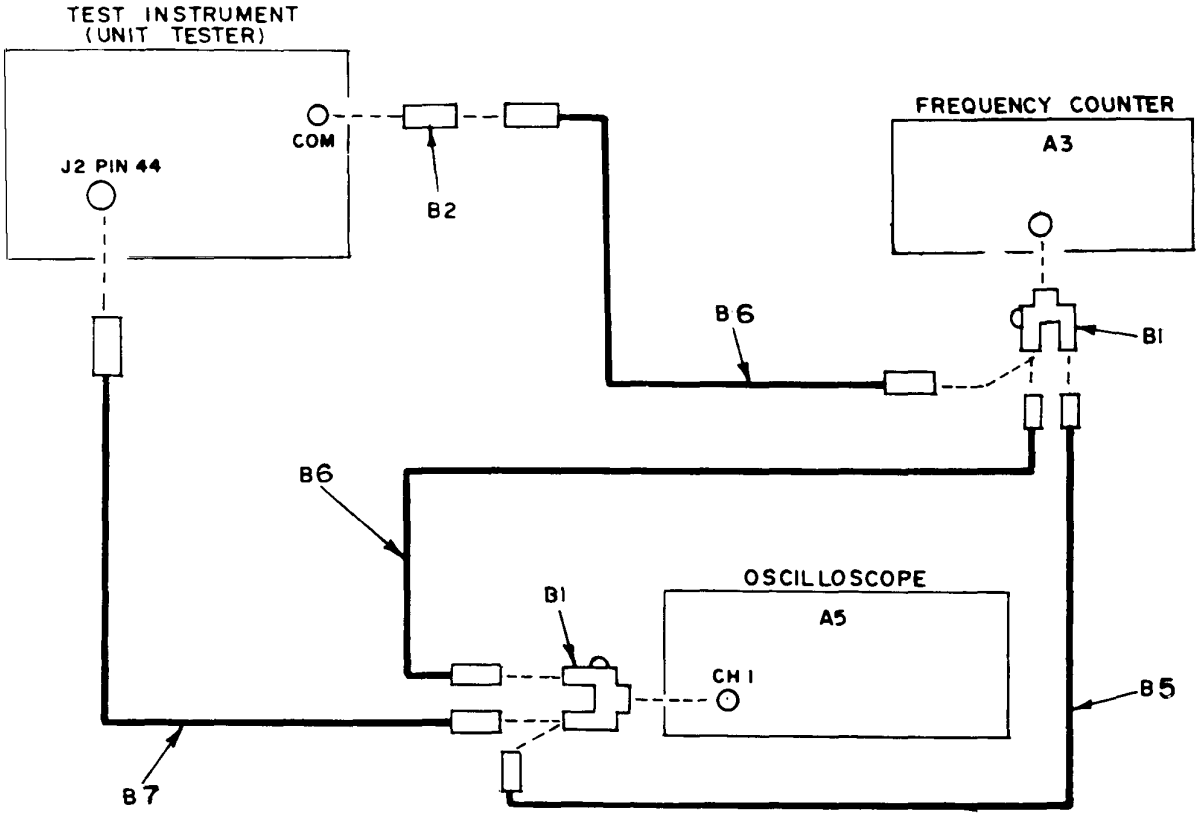

Figure 6. Display control - equipment setup.

NOTE

When measuring negative pulse amplitude with oscilloscope, disconnect frequency counter after verifying frequency.

(3) Set ON-OFF-SIM ONLY switch to ON. Oscilloscope (A5) will indicate negative pulses between 4.0 and 6.0 V and frequency counter (A3) will indicate between 1300 and 1900 Hz.

(4) Set DISPLAY UPDATE and ON-OFF-SIM ONLY switches to OFF.

(5) Repeat technique of (2) through (4) above, connecting lead (B7) to pin connections listed in table 6. Oscilloscope and frequency counter will indicate within limits specified.

b. Adjustments. No adjustments can be made.

Table 6. Display Update (Unit Tester)

Unit tester pin connections	Oscilloscope indications	Frequency counter indications
J1 Pin 45 46 46 50 J3 Pin 44 45 46 47 50 J6 Pin 17 18 19 20 21	Negative pulses between 4.0 and 6.0 V	Between 1300 and 1900 Hz
J2 Pin 48 49 J3 Pin 48 49 J6 Pin 22 23	Negative pulses between 4.0 and 6.0 V	Between 1300 and 1900 Hz
J2 Pin 51 52 J3 Pin 51 52 J6 Pin 14 15	Square wave between 4.0 and 6.0 V	Between 285 and 1000 ms (1.0 and 3.5 Hz)

23. Power Supply

NOTE

Do not perform power supply check if all other parameters are within tolerance.

a. Performance Check

(1) Set all power to TI to OFF.

(2) Remove power supply board (A1) (fig. 4) and reconnect, using extender board (B4).

(3) Connect digital voltmeter (A3) positive to loop 18 and negative to loop 14 on extender board, using two leads (B8).

(4) Set power to TI to ON. If digital voltmeter does not indicate between 11.5 and 12.5 V dc, perform **b**(1) below.

(5) Disconnect lead from loop 18 and connect to loop 46. If digital voltmeter does not indicate between 11.5 and 12.5 V dc, perform **b**(2) below.

(6) Disconnect lead from loop 46 and connect to loop 13. If digital voltmeter does not indicate between -11.5 and -12.5 V dc, perform **b**(3) below.

(7) Remove extender board and reinstall power supply board.

b. Adjustments

(1) Adjust R19 (fig. 4) for 12.0 V dc indication on digital voltmeter (R).

(2) Adjust A1R18 (fig. 4) for 12.0 V dc indication on digital voltmeter (R).

(3) Adjust R20 (fig. 4) for -12.0 V dc indication on digital voltmeter (R).

24. Final Procedure

a. Deenergize and disconnect A1 equipment and if required, 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 tire 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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