

TECHNICAL MANUAL

**AVIATION UNIT AND INTERMEDIATE
MAINTENANCE MANUAL**

VOLUME 5 OF 9

**HELICOPTER, ATTACK,
AH-64A APACHE
(NSN 1520-01-106-9519)
(EIC: RHA)**

**CHAPTER 8
INSTRUMENTS**

**CHAPTER 9
ELECTRICAL SYSTEM**

ENGINE INSTRUMENTS MAINTENANCE
FLIGHT INSTRUMENTS MAINTENANCE
NAVIGATION INSTRUMENTS MAINTENANCE
MISCELLANEOUS INSTRUMENTS MAINTENANCE
POWER GENERATION AND DISTRIBUTION MAINTENANCE
LIGHTING PROVISIONS MAINTENANCE
CAUTION AND WARNING MAINTENANCE
MISCELLANEOUS ELECTRICAL MAINTENANCE

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* This manual together with TM 1-1520-238-23-1, 16 May 1994, TM 1-1520-238-23-2, 16 May 1994, TM 1-1520-238-23-3, 16 May 1994, TM 1-1520-238-23-4, 16 May 1994, TM 1-1520-238-23-6, 16 May 1994, TM 1-1520-238-23-7-1, 16 May 1994, TM 1-1520-238-23-7-2, 16 May 1994, TM 1-1520-238-23-8, 16 May 1994, TM 1-1520-238-23-9, 16 May 1994, supersedes TM 55-1520-238-23-1, 7 June 1988, TM 55-1520-238-23-2, 7 June 1988, TM 55-1520-238-23-3, 7 June 1988, TM 55-1520-238-23-4, 7 June 1988, TM 55-1520-238-23-5, 7 June 1988, TM 55-1520-238-23-6, 7 June 1988, TM 55-1520-238-23-7, 7 June 1988, TM 55-1520-238-23-8, 7 June 1988, TM 55-1520-238-23-9, 7 June 1988, TM 55-1520-238-23-10, 7 June 1988, including all changes.

CHAPTER 8 INSTRUMENTS

CHAPTER OVERVIEW

Chapter 8 contains the maintenance instructions for the instruments system. Instruments system description, operation, and troubleshooting information is contained in TM 1-1520-238-T.

CHAPTER INDEX

<u>Para Title</u>	<u>Para No.</u>
SECTION I. ENGINE INSTRUMENTS MAINTENANCE	
Engine Instruments Inspection	8.1
Typical Engine Instrument Indicator Disassembly/Assembly (AVIM)	8.2
Pilot/CPG Engine Torque Indicator Removal/Installation	8.3
Pilot/CPG Engine/Rotor RPM Indicator Removal/Installation	8.4
Engine/Rotor RPM Indicator Front Panel Removal/Installation (AVIM)	8.5
Pilot Engine Oil Pressure Indicator Removal/Installation	8.6
Engine Oil Pressure Indicator Front Panel Removal/Installation (AVIM)	8.7
Pilot Fuel Quantity Indicator Removal/Installation	8.8
Pilot Engine Turbine Gas Temperature (TGT) Indicator and Engine Gas Generator N _G RPM Indicator Removal/Installation	8.9
Torque, TGT, Fuel, and N _G Indicators Light Panel, Digital Display Driver Circuit Card Replacement (AVIM)	8.10
Analog or Interface Circuit Card on Torque, TGT, Fuel, and N _G Indicators Replacement (AVIM)	8.11
Vertical Display Lamp Board Replacement (AVIM)	8.12
CPG Selectable Digital Display (SDD) Panel Removal/Installation	8.13

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Selectable Digital Display (SDD) Panel Front Panel Removal/Installation (AVIM)	8.14
Selectable Digital Display (SDD) Panel Switch Module Replacement (AVIM)	8.15
Selectable Digital Display (SDD) Panel Circuit Card Replacement (AVIM)	8.16
Selectable Digital Display (SDD) Panel Case Replacement (AVIM)	8.17
Signal Data Converter Removal/Installation	8.18
Signal Data Converter Circuit Card Replacement (AVIM)	8.19
Signal Data Converter Power Supply Replacement (AVIM)	8.20
Signal Data Converter Tray Removal/Installation	8.21
Pilot/CPG Engine Instrument Dim/Test Control Panel Removal/Installation	8.22
Pilot/CPG Engine Instrument Dim/Test Control Panel Disassembly/Assembly (AVIM)	8.23
Pilot/CPG Engine Instrument Dim/Test Control Panel Front Panel Removal/Installation (AVIM)	8.24
CPG Engine Instruments Dimmer Power Supply Removal/Installation	8.25
CPG Engine Instruments Dimmer Power Supply Connector Replacement	8.26
Fuel Signal Conditioner Removal/Installation	8.27
Engine Out Warning Control Removal/Installation	8.28

SECTION II. FLIGHT INSTRUMENTS MAINTENANCE

Flight Instruments Inspection	8.29
Pilot/CPG Airspeed Indicator Removal/Installation	8.30
Pilot/CPG Barometric Altimeter Removal/Installation	8.31
Pilot/CPG Vertical Speed Indicator Removal/Installation	8.32
Pilot Accelerometer Removal/Replacement	8.33
Pilot Standby Attitude Indicator Removal/Installation	8.34
CPG Remote Attitude Indicator Removal/Installation	8.35

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Pitot Static Tester Installation/Removal	8.36
Right or Left Wing Pitot Tube Removal/Installation	8.37
Pitot Static System Tubing Transition Replacement	8.38
Pitot Static System Tubing Splice Replacement	8.39
Pitot Static System Tubing Swagelok Fitting Replacement	8.40
 SECTION III. NAVIGATION INSTRUMENTS MAINTENANCE	
Navigation Instruments Inspection	8.41
Pilot Magnetic Compass Removal/Installation	8.42
 SECTION IV. MISCELLANEOUS INSTRUMENTS MAINTENANCE	
Miscellaneous Instruments Inspection	8.43
Hydraulic Pressure Indicator Removal/Installation	8.44
Dual Hydraulic Pressure Indicator Removal/Installation	8.45
Pilot/CPG Clock Removal/Installation	8.46
Outside Air Temperature Indicator Removal/Installation	8.47
Pilot/CPG Stabilator Position Indicator Removal/Installation	8.48
Pilot/CPG Stabilator Position Placard ILT Panel Removal/Installation	8.49
Pilot Icing Severity Meter Removal/Installation	8.50

SECTION I. ENGINE INSTRUMENTS MAINTENANCE

8.1. ENGINE INSTRUMENTS INSPECTION

8.1.1. Descriptio

This task covers: Inspection.

8.1.2. Initial Setup

Personnel Required:

68X Armament/Electrical System Repairer

Equipment Conditions:

<u>Ref</u>	<u>Condition</u>
1.57	Helicopter safed
2.2	Access doors opened and covers, panels, and fairings removed as necessary

8.1.3. Inspection

- a. **Check engine instruments and instrument panel mounting areas for dents, nicks, and cracks.** None allowed.
- b. **Check front panels of instruments for dents, nicks, and cracks.** None allowed.
- c. **Check instruments and their front panels, covers, switches, pointers, and knobs for loose installation.** None allowed.
- d. **Check instruments for loose or missing hardware.** None allowed.
- e. **Check indicator case for stripped or damaged threads.** Acceptable thread damage cannot exceed 50 percent of one thread.
- f. **Check pointers on instrument faces for wear and damage.** None allowed.
- g. **Check instrument scales for wear, illegibility, distortion, and discoloration.** None allowed.
- h. **Check electrical connectors for loose installation.** Inspect for loose or broken lockwiring (QA). None allowed.
- i. **Check instruments for fogging and moisture.** None allowed.
- j. **Check lamp boards for cracks, loose or broken pins, and broken lamp filaments.** None allowed.
- k. **Secure opened doors; install removed covers, panels, and fairings** (para 2.2).

END OF TASK

8.2. TYPICAL ENGINE INSTRUMENT INDICATOR DISASSEMBLY/ASSEMBLY (AVIM)

8.2.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

8.2.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
 Light duty laboratory apron (item 27, App H)
 3/16-inch flat tip screwdriver bit (item 31, App H)
 #1 phillips screwdriver bit (item 35, App H)
 Circuit extractor (item 127, App H)
 Chemical protective gloves (item 154, App H)
 PC shunt bar (item 223, App H)
 Adjustable air filtering respirator (item 262, App H)
 Large wrist grounding strap (item 346, App H)
 1 - 100 inch-ounce 1/4-inch hexagon drive click type
 torque wrench (item 437, App H)

Materials/Parts:

Cloth (item 52, App F)
 Coating compound (item 59, App F)
 Lubricant (item 115, App F)

Personnel Required:

68X Armament/Electrical System Repairer
 68X3F Armament/Electrical System Repairer/
 Technical Inspector

NOTE

This procedure is generalized. Refer to tasks in this section to perform maintenance on a particular engine instrument.

GO TO NEXT PAGE

8.2. TYPICAL ENGINE INSTRUMENT INDICATOR DISASSEMBLY/ASSEMBLY (AVIM) – continued

CAUTION

Static electrical discharge can damage semiconductors in the circuit card. To prevent damage, repairer must wear grounding strap when panel is removed, and when handling circuit cards.

8.2.3. Disassembly

NOTE

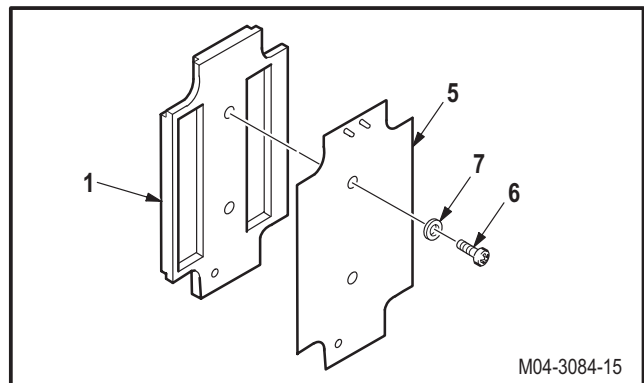
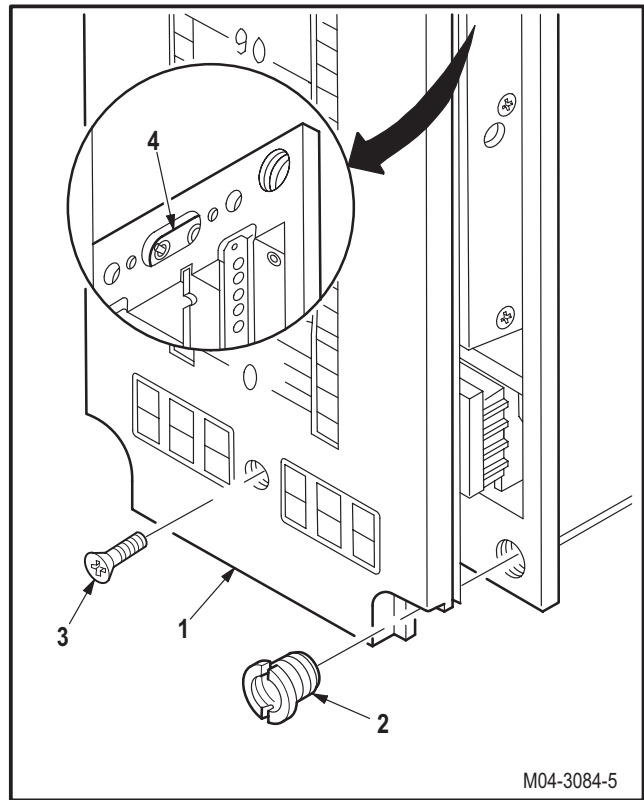
Steps a, b, and c are typical for fuel quantity, N_G, TGT, and torque indicators.

- a. **Remove front panel (1).** Wear grounding strap.
 - (1) Remove four bushings (2) and one screw (3).
 - (2) Carefully pull front panel (1) outward until light connector (4) detaches.

NOTE

The torque indicator does not contain a separate lighting panel.

- b. **Remove lighting panel (5) from front panel (1).**
 - (1) Remove two screws (6) and washers (7).
 - (2) Remove panel (5).



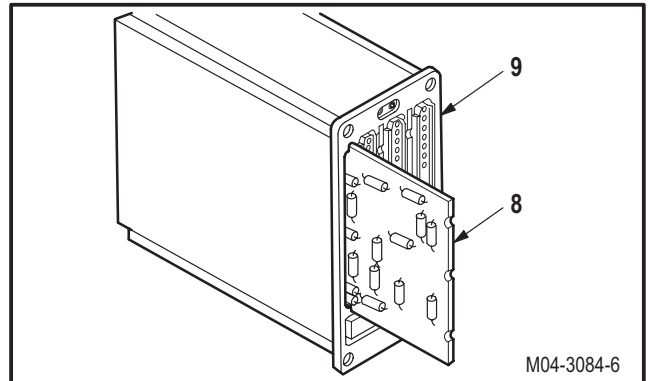
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8.2. TYPICAL ENGINE INSTRUMENT INDICATOR DISASSEMBLY/ASSEMBLY (AVIM) – continued

- c. **Remove circuit cards (8) from indicator case (9).** Wear grounding strap. Use circuit extractor and grounding strap.

NOTE

Step d is necessary for removal of rpm interface/interface voltmeter/oil pressure excitation circuit card.



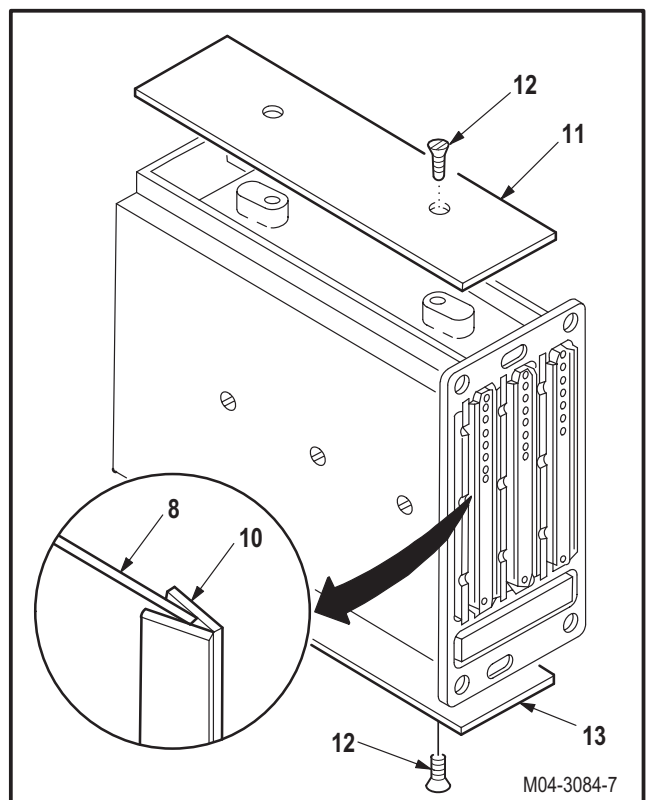
- d. **Install shunt bar (10) on card (8).** Use shunt bar.

- e. **Remove top cover (11).**

- (1) Remove two screws (12).
- (2) Remove cover (11).

- f. **Remove bottom cover (13).**

- (1) Remove two screws (12).
- (2) Remove cover (13).



GO TO NEXT PAGE

8.2. TYPICAL ENGINE INSTRUMENT INDICATOR DISASSEMBLY/ASSEMBLY (AVIM) – continued

g. **Remove motherboard wiring subassembly (14).**

- (1) Remove four screws (15) that hold connector (16) and plate (17).
- (2) Remove four screws (18) that hold motherboard (19) and subassembly (14) to four mounting blocks (20).
- (3) Slide subassembly (14) and motherboard (19) out through front of indicator case (9).

h. **Remove four blocks (20).**

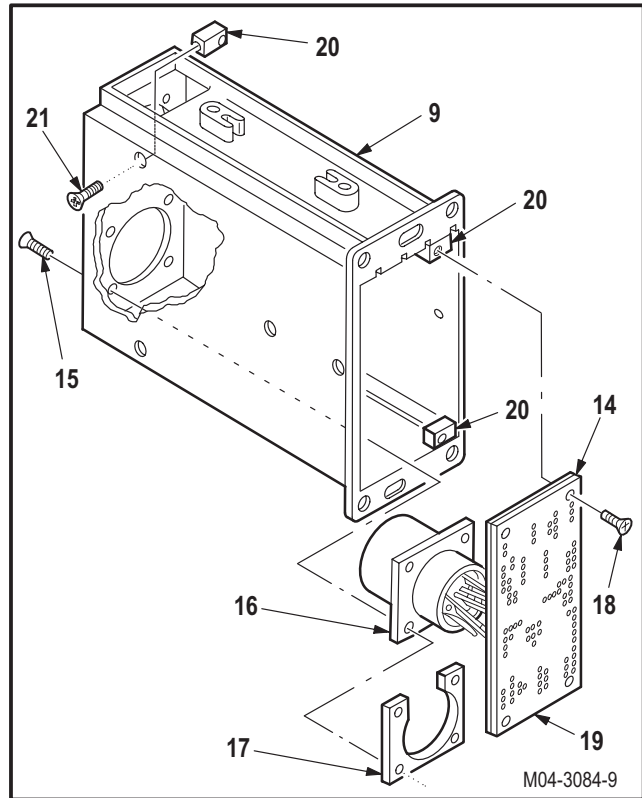
- (1) Remove four screws (21).
- (2) Remove four blocks (20).

8.2.4. Cleaning

- a. **Wipe front panel, front panel mounting area, circuit cards, and circuit card guide.** Use cloth (item 52, App F).

8.2.5. Inspection

- a. **Check engine indicator for cracks** (para 8.1).
- b. **Inspect engine indicator for nicks and dents** (para 8.1).
- c. **Check indicator case for stripped or damaged threads** (para 8.1).



GO TO NEXT PAGE

8.2. TYPICAL ENGINE INSTRUMENT INDICATOR DISASSEMBLY/ASSEMBLY (AVIM) – continued

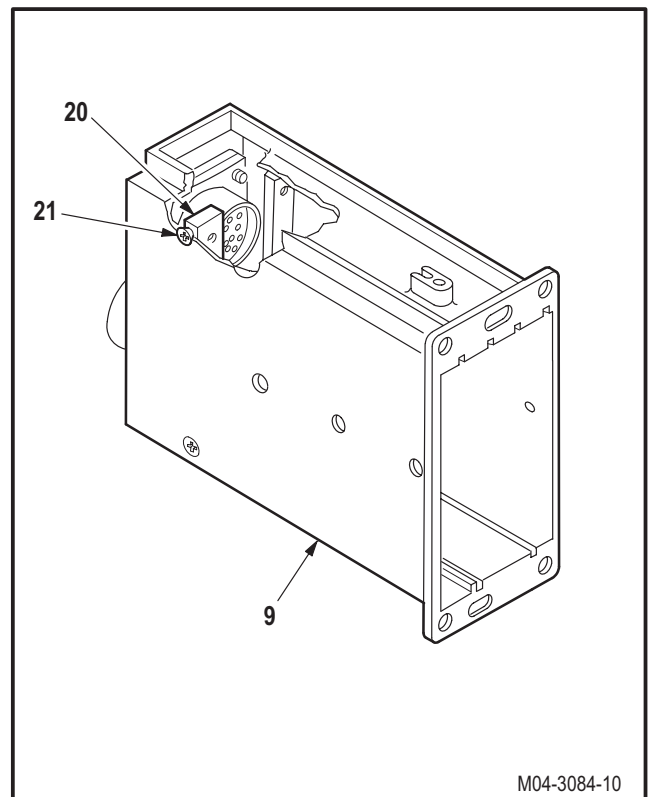
CAUTION

Static electrical discharge can damage semiconductors in the circuit card. To prevent damage, repairer must wear grounding strap when panel is off, and when handling circuit cards.

8.2.6. Assembly



- a. **Install four blocks (20).** Torque four screws (21) to **37 INCH-OUNCES**.
 - (1) Coat threads of four screws (21). Use coating compound (item 59, App F).
 - (2) Aline four blocks (20) with four screw holes inside case (9).
 - (3) Install four screws (21) to secure four blocks (20).
 - (4) Torque four screws (21) to **37 INCH-OUNCES**. Use torque wrench and screwdriver bit.



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GO TO NEXT PAGE