
DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

**YELLOW AND BLUE WIRE HARNESS INSULATION
RESISTANCE CHECK FOR ALL AH-64A AIRCRAFT
WITH T700-GE-701 ENGINES**

Headquarters, Department of the Army, Washington, D.C.

30 December 1994

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.**NOTE****THIS PUBLICATION IS EFFECTIVE UNTIL SUBJECT AIRCRAFT HAS BEEN INSPECTED
UNLESS SOONER RESCINDED OR SUSPENDED.****1. Priority Classification. ROUTINE.**

a. Aircraft in Use. Upon receipt of this Technical Bulletin (TB) the condition status symbol of the cited aircraft will be changed to a red horizontal dash "-". The red horizontal dash "-" may be cleared when the inspection of paragraph 8 below is completed. The affected aircraft shall be inspected as soon as practical but no later than the task/inspection suspense date. Failure to comply with the requirements of this Technical Bulletin within the time frame will cause the status symbol to be upgraded to a red "X".

b. Aircraft in Depot Maintenance. Aircraft will not be issued until compliance with this TB has been completed.

c. Aircraft Undergoing Maintenance. Aircraft will not be released until compliance with this TB has been completed.

d. Aircraft in Transit.

(1) Surface/Air Shipment. At next phase inspection (250 hours).

(2) Ferry Status. Same as paragraph 1 .a. Those aircraft that have a DD Form 250, Materiel Inspection and Receiving Report, and are at McDonnell Douglas Helicopter Systems (MDHS) will be inspected prior to ferry to final destination.

e. Maintenance trainers (Category A, B and C). Same as paragraph 1.a.

f. Component/Parts in Stock including War Reserves at all levels (Depot and others). Not applicable.

2. Task/Inspection Suspense Date. At next phase inspection (250 hours).

3. Reporting Compliance Suspense Date. Not applicable.

4. Summary of Problem.

- a. Issues with the integrity of the blue and yellow wire harnesses on the -701 engine has prompted a requirement to check their insulation resistance levels.
- b. For manpower/downtime and funding impacts see paragraph 12.
- c. The purpose of this TB is to measure the insulation resistance levels on the blue and yellow wire harnesses and compare them with accepted values.

5. End Items to be Inspected. All AH-64A aircraft with T700-GE-701 engines.

6. Assembly Components to be Inspected.

NOMENCLATURE	PART NO.	NSN
Engine Assembly	6044T06G01	2840-01-114-2211

7. Parts to be Inspected.

NOMENCLATURE	PART NO.	NSN
Harness, Yellow	6044T60P01	2925-01-144-0102
	6044T60P03	6150-01-321-3078
Harness, Blue	6044T83P02	2925-01-143-7341
	6044T83P05	2925-01-143-7341

8. Inspection Procedures.

a. General Theory of Operation.

(1) When the harness under test is connected to the test box (refer to para 11 .a.), all wires and the shield are tied together to the megohmmeter negative side. The switches numbered 1 through 31 (right side of panel) are connected to each respective wire in the yellow harness. Switches 1 through 12 (left side of panel) are connected to the blue harness connector.

(2) Operation of any switch removes that individual wire from all the others including the shield and connects it to the megohmmeter positive side. The megohmmeter will then read the insulation resistance between the wire under test and all the others including the shield.

(3) The test box has capability to plug in a megohmmeter capable of generating up to a 500 volt signal (DC voltage), which is induced into the harness being tested. The test box has the capability of isolating different pins in the harness, and will provide impedance values while under load.

b. Applicability.

This test box is for testing the following cables/connectors.

(1) Yellow cables with size 18-31 scoop proof connectors with a normal key arrangement such as found on cables P/N 6044T60P01 and 6044T60P03.

(2) Blue cables with size 12-12 scoop proof connectors with an "06" key arrangement such as found on cables P/N 6044T83P02 and 6044T83P05.

c. Test procedure for yellow/blue harness insulation resistance check with external megohmmeter.

(1) Set up test equipment on suitable work table area. Plug in megohmmeter to port TP1/TP2 on switch box where positive lead of megohmmeter is inserted into TP1 and negative lead is inserted into TP2. Ground panel to earth via E1 ground port on panel.

(2) Run fault test prior to testing session per operator's instructions of harness test set.

(3) Locate and remove both the yellow and blue harnesses from the No. 1 and No. 2 engines in accordance with TM 55-2840-248-23, Chapter 7 and mark appropriately in order to identify upon reinstallation.

(4) Yellow harness check.

Connect the yellow harness ECU connector (W4P1) to the yellow harness test port (J2) on the test box. All other yellow harness connectors and test box connectors must be disconnected.

(5) Follow instructions for the particular megohmmeter used while adjusting voltage settings, etc. Set multiplier dial to proper megohm range. Set test voltage of 500V DC.

CAUTION

Do not apply AC test voltage. Do not set voltage above 500 volts DC. Use caution due to high voltage present during this type of testing.

(6) Operate test switches S1 through S31 when testing the yellow harness. Place switches S1 through S31 down to the (-) position before start of testing. Flip S1 up to (+) position, operate megohmmeter per manufacturer's instructions to obtain reading, record reading. Return S1 to (-) position and place S2 to (+) position, operate megohmmeter again to obtain reading, record reading. Return S2 to (-) position. Continue with this sequence until all 31 switches have been exercised. Pass value is ten (10) megohms or greater..

NOTE

Only one (1) switch shall be in the (+) position during each test, all other switches shall be in the (-) position.

(7) After completion of exercising switches S1 through S31 for the yellow harness, this portion of the test is complete. Failure of any of the 31 switch positions is cause for rejection of harness. See paragraph 9 for correction procedures.

(8) Disconnect the yellow harness from the J2 port of the switch box.

(9) Blue harness check

Test the blue harness in the same manner, except plug connector W5P1 of the harness into J1 connector (left side) on switch box, toggle switch S33 to "blue", and exercise switches S1 through S12 on left side of panel. Record readings. Pass value is ten (10) megohms or greater..

(10) After completion of exercising switches S1 through S12 for the blue harness, the test is complete. Failure of any of the 12 switch positions is cause for rejection of harness. See paragraph 9 for correction procedures.

(11) If either blue or yellow harnesses are serviceable, reinstall harnesses on engines per TM 55-2840-248-23, Chapter 7.

(12) Perform checks per TM 55-2840-248-23, Table 1-11.

9. Correction Procedures. If any of the insulation resistance readings fall below the minimum indicated pass values, proceed as follows:

a. Clean the connectors per TM 55-2840-248-23, Appendix H, paragraph H-11, using isopropyl alcohol. (Refer to paragraph 10.c.) Carefully observe all applicable warnings.

b. Allow the connectors to air dry for a minimum of one hour prior to retesting.

c. Repeat the insulation resistance checks per paragraph 8.

d. If any of the insulation resistance readings still fall below the minimum indicated pass values, proceed as follows:

(1) For the yellow harness, the aircraft shall be grounded until a new harness is installed.

(2) If any blue harness pin insulation resistance falls between 1 megohm and 10 megohms, the aircraft may continue to fly. Replacements, however, are still required and shall be made upon receipt. Units who have blue harnesses with pin values below 1 megohm shall phone the Technical Point of Contact(s) for further instructions.

10. Supply/Parts and Disposition.

a. Parts Required. Items cited in paragraphs 6 and 7 may be required to replace defective items.

b. Requisitioning Instructions. Requisition replacement parts through normal supply channels using normal supply procedures.

c. Bulk and Consumable Materials.

NOMENCLATURE	NSN	QUANTITY
Alcohol, Isopropyl TT-I-735, Grade B	6810-00-753-4993	8 ounce

d. Disposition. Dispose of removed parts/components in accordance with normal supply procedures.

e. Disposition of Hazardous Material. Not applicable.

11. Special Tools, Jigs and Fixtures Required.

- a. Test Box, P/N LEX 5621-10. Manufacturer SERV-AIR, INC. (Test Box shall be provided at AVIM level.)
- b. Megger, P/N 212159. Manufactured by Biddle Co., NSN 6625-00-141-3558.

12. Application.

- a. Category of Maintenance - AVIM. Aircraft downtime will be charged to AVIM.
- b. Time Required.

- (1) Total of 8 manhours using 2 persons.
- (2) Total of 4 hours downtime for one end item.

- c. Estimated Cost Impact of Stock Fund Items to the Field.

NOMENCLATURE	PART NO.	NSN	COST EA.
Harness, Yellow	6044T60P01	2925-01-144-0102	\$3,590.00
	6044T60P03	6150-01-321-3078	3,590.00
Harness, Blue	6044T83P02	2925-01-143-7341	1,173.00
	6044T83P05	2925-01-143-7341	1,173.00

- d. TB/MWO'S to be applied prior to or concurrently with this inspection. Not applicable.

e. Publications which require change as a result of this inspection. TM 55-2840-248-23 and TM 1-1520-238-PMS shall be changed to reflect this TB. A copy of this TB shall be inserted in the appropriate TM as authority to implement the change until the printed change is received.

13. References. TM 55-2840-248-23, AVIM and AVUM Maintenance Manual.

14. Recording and Reporting Requirements.

- a. Reporting Compliance Suspense Date (Aircraft). Not applicable.

b. Task/Inspection Reporting Suspense Date (Aircraft). Upon completion of inspection, units will forward a priority message to: Commander, ATCOM, ATTN: AMSAT-R-EIA. The report will cite this TB number, date of inspection, aircraft serial number, aircraft and component hours, and results of the inspection. Inspection and reports will be completed no later than 10 days after task/inspection suspense date.

- c. Reporting Compliance Suspense Date (SPARES). Not applicable
- d. Task/Inspection Reporting Suspense Date (SPARES). Not applicable.

- e. The following forms are applicable and are to be completed in accordance with DA PAM 738-751, 15 June 1992

- (1) DA Form 2408-5-1, Equipment Modification Record (Engine)
- (2) DA Form 2408-15, Historical Record for Aircraft

- (3) DA Form 2408-13, Aircraft Status Information Record.
- (4) DA Form 2408-13-1, Aircraft Inspection and Maintenance Record.

15. Weight and Balance. Not applicable.

16. Points of Contact.

a. Technical Point of Contact for this TB is Mr. Matt Benzek, AMSAT-R-EIA or Mr. Dick Hazlewood EPE, DSN 693-1680/1145 or Commercial (314)263-1680/1145, respectively.

b. Logistical Point of Contact for this TB is Mr. Jim Mason, SFAE-AV-AAH-LS, DSN 693-1946, or (314)263-1946.

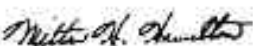
c. Forms and Records Point of Contact for this TB is Mrs. Ann Waldeck AMSAT-I-MDM, DSN Commercial (314)263-1758.

d. Foreign Military Sales (FMS) recipients requiring clarification of action advised by this TB should Jay Nance or Mr. Ron Van Rees, AMSAT-I-IA, DSN 693-3659/3826 or Commercial (314)263-3659/3826.

e. After hours contact ATCOM Command Operations Center (COC) DSN 693-2066/2067 or Commercial 2066/2067.

17. Reporting of Errors and Recommending Improvements. You can help improve this TB. If you find or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (R Changes to Publications and Blank Forms) direct to: Commander, US Army Aviation and Troop Command AMSAT-I-MP, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished to you.

By Order of the Secretary of the Army:

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DISTRIBUTION:

To be distributed in accordance with DA Form 12-31-E, block no. 3480, requirements for TB 1-2840-248-20

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

 <p style="font-size: small; margin: 0;"><i>THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.</i></p>		SOMETHING WRONG WITH PUBLICATION	
		FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)	
		DATE SENT	
PUBLICATION NUMBER		PUBLICATION DATE	PUBLICATION TITLE
IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.			
BE EXACT PIN-POINT WHERE IT IS			
PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER		SIGN HERE	

THE METRIC SYSTEM AND EQUIVALENTS

WEIGHT MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
 1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 1000 Grams = 2.2 lb.
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

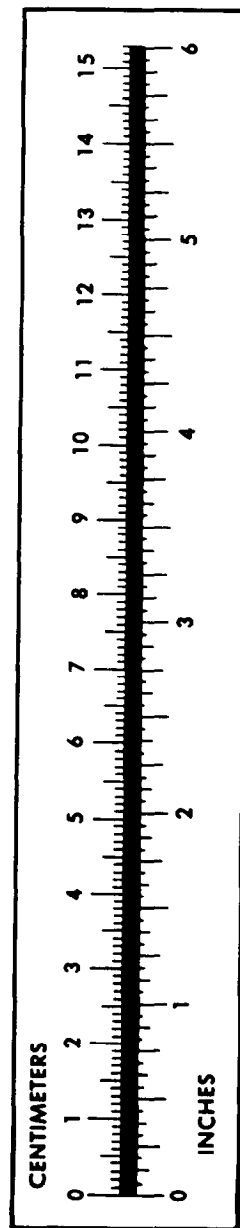
TEMPERATURE

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
its	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
ometers per Liter	Miles per Gallon	2.354
ometers per Hour	Miles per Hour	0.621



PIN: 073435-000