DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

INSTALLATION OF ENVIRONMENTAL SEALS ON CABLECRAFT LOAD DEMAND SPINDLES

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

10 January 1994

NOTE

THIS PUBLICATION IS EFFECTIVE UNTIL RESCINDED OR SUPERSEDED.

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 (see paragraph 2 below).

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 issued until compliance with this TB has been completed.

d. Aircraft in Transit.

(1) Surface/Air Shipment. Prior to first flight.

(2) Ferry Status. Inspect at final destination.

e. Maintenance Trainers (Category A, B and others). Same as paragraph above.

2. Task/Inspection Date Prior to operating aircraft in freezing ambient temperatures (32° degrees Fahrenheit or below).

3. Reporting Compliance Suspense Date. Not applicable.

4. Summary of Problem.

a. Aircraft equipped with Load Demand Spindle (LDS) Cables manufactured by Cablecraft are susceptible to water intrusion. If water enters the cables and freezes, damage may result. As a preventative measure, preheating the Cablecraft Cables is required when operating in cold-weather/freezing temperatures (Ref., paragraph 4.d). Aircraft with Controlex Cables installed are not affected. Refer to paragraph 4.c for a description of the two-types of cables.

b. For manpower/downtime and funding impacts, see paragraph 12.

c. The purpose of this TB is to furnish a procedure for installing Environmental Seals (175-313-002) on Cablecraft Cables to prevent water intrusion. After installation of these seals, no cold-weather preheating is required. Cablecraft Cables can be easily identified by their black external coating/conduit. In comparison, Controlex Cables are a silver-colored spiral conduit.

d. Aircraft operating with Cablecraft Cables in freezing ambient temperatures (32 degrees Fahrenheit or below) without Environmental Seals installed, shall be preheated as follows.

(1) Using a suitable heat source (Herman-Nelson, AGPU, or equivalent unit), warm the transmission bay for a minimum of 20 minutes. Ensure that the cables have been thawed (warm to the touch).

(2) Aircraft equipped with a Back-Up Control System (BUCS) shall perform a manual control sweep prior to a BUCS Self Test during run-up.

(3) During the control sweep, the LDS Cables and Brackets, are to be monitored (observed) to ensure that the cables move freely and that there is no bending, deflection or deformation of the LDS Bellcrank Bracket, LDS Cable Bracket or Transmission Deck.

(4) Discontinue any control movement immediately if any bending, deflection or deformation occurs.

5. End Items to be Inspected. All AH-64A Aircraft.

6. Assembly Components to be Inspected.

Nomenclature	Part Number	NSN
Control Assembly	7-117600001-39	2995-01-319-0325
Control Assembly	7-117600001-41	2995-01-319-0327

7. Parts to be Inspected. Not applicable.

8. Inspection Procedures Determine the manufacturer of the LDS Cables: Cablecraft (black outer coating), or Controlex (silver spiral shell).

a. Cablecraft Cables (black) require removal from the aircraft for rework.

b. Controlex Cables (silver) require no further action.

9. Correction Procedures

a Remove the No. 1 and No. 2, Engine Forward IDS Cables (7-117600001-39/-41), in accordance with (I/A/W) task 4-8-12, reference paragraph 13.

CAUTION

Application of a heat gun may be required to loosen the retaining compound (Loctite) that is installed when the Cable Assembly and Support Tube are assembled. Do not exceed 225 degrees Fahrenheit.

b. Place the 7-117600001-39 and -41 Cable Assemblies on a dean flat surface. Remove the Support Tube from the cable by un-tightening the support: use two wrenches, on each set (side) of the hexagon flats (tube and support). Retain the Support Tube for reinstallation.

c. Suspend the Cable Assembles with the rod-ends downward to allow for any water drainage. Cycle the cables (push & pull) while they are suspended until no visible water droplets drain from the cables.

NOTE

New replacement Cable Assemblies (with no accrued flight hours) do not require the heating procedure below prior to installing the Environmental Seals.

CAUTION

Temperatures in excess of 225 degrees Fahrenheit may damage the Cable Assemblies, requiring replacement. Maintain the cables in a protected environment away from high-humidity conditions. The seals shall be installed as soon as practical, after the heating and cooldown process is complete.

d. Place the cables in a suitable oven and heat them to 220 degrees Fahrenheit, ± 5 degrees, for 3 hours. The cables may be coiled as necessary. Allow sufficent time for cooldown before handling.

CAUTION

After performing the heating procedure, maintain the cables in a secure and protected environment away from high-humidity conditions. This is required until the cables are re-assembled with seals to prevent moisture condensation within the cable.

e. Degrease and dean the Support Tubes and the Environmental Seals (175-313-002), as required. The mating surface of the seals and supports must be clean.

f. Install the seals onto the ends of the Support Tubes; completely seat the seals.

g. Apply Loctite 88 or equivalent to the threads of the cable and support. Reinstall the Support Tubes onto the Cable Assemblies, and torque to 100 inch pounds.

CAUTION

Do not apply, or otherwise allow, the lubricant to contact the support Tubes.

h. Apply a thin film of Silicone Lubricant (Molykote 33 or equivalent), to the sliding surface at the seal contact area(s). Do not apply the lubricant onto the Support Tubes.

NOTE

Disregard the Friction Load Check (step a.1) performed during installation. Cables with seals installed will exceed the normal friction loads. This applies — only to cables with seals installed.

i. Reinstall the LDS Cables into the aircraft I/A/W task 4-8-13, ref. paragraph 13.

j. Perform the LDS Rigging Check l/AW task 4-8-34, ref. paragraph 13.

k. Install access panel L200 and R200; and secure doors RN1, T250L, T250R, T290L, T290R and L325.

10. Supply/Parts and Disposition.

a Parts Required.

Nomenclatura	Part Number	Qty	NSN
Environmental Seals	175-313-002	2	5330-01-383-3872

b. Requisitioning Instructions. The Envionmental Seals shall be provided by Mr. Jim Mason, ATCOM SFAE-AV-AAH-LS, DSN 693-1947, -1948 Commercial: (314) 263-1946.

c. Bulk and Consumable Materials.

Nomenclature	Part Number	NSN
Loctite 88 (or equivalent)	088-41	8030-00-067-6744
Lubricant, silicone (or equivalent)	Molykote 33 Light	9150-00-145-0161

d. Disposition. Dispose of removed parts/components in accordance with normal supply procedures. A QDR is not required.

e. Disposition of Hazardous Material. Not applicable.

11. Special Tools, Jigs and Fixtures Required. Not applicable.

12. Application.

a. Category of Maintenance. AVUM, Aircraft downtime will be charged to AVUM.

b. Time Required.

(1) Total of 6 man-hours using 1 person.

(2) Total of 6 hours downtime for one end item.

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

d. Disposition. Dispose of removed parts/components in accordance with normal supply procedures. A QDR is not required.

e. TB/MWO's To Be Applied Prior To or Concurrently With This Inspection. Not applicable.

f. Publications That Require a Change as a Result of This Inspection-TM 1-1520-238-23-3 will be changed IAW 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 55-1520-238-23-3: Aviation Unit and Intermediate Maintenance Manual for Army AH-64A Helicopter, dated 07 JUN 88, w/chg., no 18.

14. Recording and Reporting Requirements.

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

(1) DA Form 2408-13-1, Aircraft Inspection and Maintenance Record.

(2) DA Form 2408-15, Historical Record for Aircraft.

(3) DA Form 2408-18, Equipment Inspection List.

15. Weight and Balance. Not applicable.

16. Points of Contact.

a. Technical point of contact for this TB is Mr. Ken Muzzo, AMSAT-I-MEAS, DSN 693-5420 or commercial (314) 263-5420.

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

c. Forms and records point of contact for this TB is Mrs. Ann Waideck, AMSAT-I-MDM, DSN 693-1821/1955 or commerical (314) 263-1821/1955.

d. Foreign Military Sales (FMS) recipients requiring clarification of action advised by this TB should contact MW4 Jay Nance/Mr. Ron Van Rees, AMSAT-I-IA, DSN 693-3826/3659 or commerical (314) 263-3826/3659.

By Order of the Secretary of the Army:

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General, United States Army
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THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. 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

'VEIGHTS

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

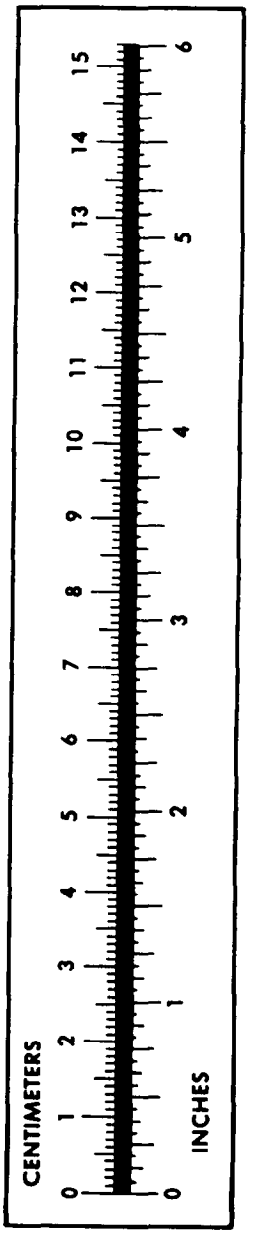
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°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
ıts	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
lometers per Liter	Miles per Gallon	2.354
meters per Hour	Miles per Hour	0.621



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