TB 55-2840-248-20-17

TECHNICAL BULLETIN

SANDY ENVIRONMENT AND/OR COMBAT OPERATIONS

FOR

T700 SERIES ENGINES

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HEADQUARTERS, DEPARTMENT OF THE ARMY

5 DECEMBER 1990

NORMAL

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DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

SANDY ENVIRONMENT AND/OR COMBAT OPERATIONS FOR T700 SERIES ENGINES

Headquarters, Department of the Army Washington, D.C.
5 December 1990

NOTE

This publication is effective until rescinded or superseded.

1. Purpose. This bulletin is to be used as guidance while operating Army engines in a sandy environment, and/or during combat operations.

2. Priority Classification. This technical bulletin is classified as NORMAL.

Equipment in Use (Including Equipment in Supply or Maintenance Activities Below Depot Level and Equipment in Administrative Storage), Equipment in use will be inspected as soon as practicable.

3. End Items to be Inspected.

NOMENCLATURE	PART NUMBER	NSN
T700-GE-700 ENGINE	6035T00G01	2840-01-070-1003
T700-GE-701 ENGINE	6044T06G01	2840-01-114-2211
T700-GE-701C ENGINE	6071 T24G01	2840-01-284-4011

4. MODULES (COMPONENTS, ASSEMBLIES, AND SUBASSEMBLIES) TO BE INSPECTED. Not applicable.

5. Parts to be Inspected. Refer to paragraphs 9c, 9d, 13.1, 14, 15, and Section II.

6. Application.

a. Level of Maintenance. AVUM/AVIM.

b. Applied by. AVUM/AVIM.

(1) In-Flight HIT Check — Operator.

(2) Cleaning of Anti-Icing Bleed and Start Valve — AVIM.

(3) Engine Water Wash — AVUM.

(4) Hot Section Cleaning — AVIM.

(5) OBP Seal Replacement — AVIM.

c. Time Required. Not applicable.

d. Additional Information. These instructions and Tables are for sandy environment and combat operations only unless specifically stated to the contrary. Refer to Appendix A for List of Tables.

e. Any questions regarding this TB should be addressed to U.S. Army Aviation and Troop Command (ATCOM), AMSAT-R-EPE (ATTN: Richard Hazlewood), 4300 Goodfellow Blvd., St. Louis, MO 63120-1798, DSN 693-1145 or Commerical (314) 263-1145.

7. Supply Kits, Parts, and Disposition.

a. Parts Required to Accomplish Technical Bulletin. Refer to Section I.

NOTE

All records should be maintained as before. Any inspection/component removal/other maintenance action which is deferred as a result of this Technical Bulletin shall bc performed after the aircraft is removed from a sandy environment.

b. Parts Disposition. Refer to Section I.

c. Expendable Supplies.

Nomenclature	Part No./MIL Spec	National Stock Number
Brush, Soft Bristle	A-A-289	7920-00-514-2417
Brush, Wire Rifle	MIL/FED SPEC	9150-00-331-6915
Container, Plastic (5 - gallon) (Commercial)	A-A-1235	8115-00-145-0038
Crocus Cloth	A-A-1206	5350-00-221-0872
Detergent, Liquid Dish-washing (Commercial)	MIL-D- 16791	7930-00-282-9699
Fine Jewelers File	MIL/FED SPEC	
Fine Stone	SS-S-736 TY2, CLA2, ST 1	5345-00-161-9695
Fitting, Reducer	22150-10-65 FED/MIL SPEC	
Fitting, Reducer	22150-10-68 FED/MIL SPEC	
Grain, Abrasive (Aluminum Oxide)	MIL-A-21380 (120 Grit) MIL-19-21380 (150 Grit)	5350-00-184-6255 5350-01-261-9065
Moly Lubricant, High Temperature	616(71431)	9150-01-331-6975
“O” Ring	M83248/1-129	5330-01-290-2115
“O” Ring	M83248/1-273	5330-01-005-0522
“O" Ring	M83248-1-177	5330-01-005-0511
"O" Ring	M83248/1-043	5330-00-166-1049
Oil, Lubricating	MIL-L-23699 (1 - qt can) (81349)	9150-00-985-7099

c. Expendable Supplies. (Continued)

Nomenclature	Part No./MIL Spec	National Stock Number
Oil, Lubricating	MIL-L-7808 (1 - qt can) (81349)	9150-00-782-2627
Pad, Scotch Brite	L-P-0050 TY1, SZ1	7920-00-659-9175

SECTION I. SANDY ENVIRONMENT AND COMBAT OPERATIONS PROCEDURES.

NOTE

Some procedures required to accomplish sandy environment and combat operations are contained in TM 55-2840-248-23. When referencing procedures in the TM, the paragraph or figure number reference will be followed by (TM). All other paragraph or figure numbers refer to those contained in this TB.

8. In-Flight HIT Check for Sandy Environment Operations.

NOTE

This in-flight HIT CHECK data procedure shall be used to minimize engine sand ingestion in a heavy sandy environment, and shall be accomplished at an altitude where there is minimum sand intrusion.

a. Recommendations are as follows:

(1) Clean the engine using cleaning procedures (para 1-134, TM) and paragraph 10 prior to establishing a new in-flight baseline data point (para b).

(2) Establish a HIT CHECK routine during return to base.

(3) The procedure is for evaluating trends in performance, not actual engine performance. Actual performance can only be determined at unit level through accomplishmcnt of maximum power checks.

b. Procedure for baseline HIT CHECK.

(1) Perform a maximum power check in accordance with paragraphs 1-125 **(UH-60A),** 1-125.1 **(AH-64A);** and 1-125.2 **(UH-60L),** TM.

(2) Re-establish a new baseline for the HIT CHECK as follows:

(a) Establish a forward airspeed of 80 knots and a constant pressure altitude with both PCL's in fly position.

NOTE

Anti-ice and heater switches at "Off"

(b) Allow forward airspeed to increase until approximately 62% torque is read on both engines torque displays.

(c) Hold for 30 seconds. Record FAT, pressure altitude, indicated TGT, and percent TORQUE. Repeat this step three times.

(d) Use the HIT Baseline Worksheet (fig. 1), and compute the new baseline limits. Record percent TORQUE on the HIT Baseline Worksheet.

c. HIT CHECK. Procedure for Daily and Return Flight/Last Flight of Each Day.

(1) Establish same torque as shown on the HIT Baseline Worksheet.

(2) Wait 30 seconds and record FAT, pressure altitude and indicated TGT.

(3) Use the Engine Health Indicator Test Log to determine if the TGT margin is within the baseline limits.

A/C S/N _____ % TORQUE _____

A/C HOURS _____ ENGINE S/N _____

FAT _____ ENGINE HOURS _____

PA _____

NOTE

Set 62% torque on both engines simultaneously

INDICATED TGT

1. _____
2. _____
3. _____

TOTAL _____ ÷ 3 = _____ = _____AVERAGE INDICATED TGT

— _____(TABLE TGT)

_____TGT MARGIN

TGT Acceptance Limits – TGT Margin + 20 Deg C = _____

TGT Margin - 20 Deg C = _____

Record limits in A/C Engine Health Indicator Test Log

Figure 1. HIT Baseline Worksheet.

Figure 2 not used.

Tables 1 through 7 not used.

10. Engine Water Wash.

a. Normal on aircraft compressor cleaning in sandy or dusty/dirty environments should be performed every 50 engine hours (para 1-134.1, TM). Hot section cleaning of engines should be accomplished at 50 hours or sooner depending upon hot section component condition as determined in paragraph 11.

NOTE

This procedure requires standard cleaning chemicals, clean water, and a sprayer which an operator could fabricate locally or obtain from local AVSCOM representative.

b. In order to wash the hot section area, it is necessary to use a sprayer LMT 777 (fig. 5). The sprayer can be inserted into the combustion liner through the 4 or 8 o'clock igniter plug ports.

c. Spray-wash hot section as follows:

(1) Fill water-wash supply tank with cleaning solution. Attach sprayer to supply line.

(2) Remove either the 4 or 8 o'clock igniter plug.

(3) Insert sprayer into combustion liner (through either 4 or 8 o'clock igniter port) (fig. 6).

(4) Spray-wash entire interior of combustion liner and stage 1 nozzle surfaces for a minimum of 30 seconds by rotating sprayer 360 degrees.

NOTE

If cleaning compound (item 45, Appendix D, TM) is not available, clean water only may be used. Also, ZOK 27 (NSN 7930-99-741-1559) may be substituted for item 45, Appendix D, TM. Ratio of cleaner to water is 1 to 4. ZOK 27 is biodegradeable.

(5) Motor engine (para 1-134 1.b, TM) for one minute while continuing to spray.

(6) Continue to spray-wash entire interior of combustion liner and stage 1 nozzle surfaces for a minimum of one (1) minute by rotating sprayer 360 degrees.

NOTE

This procedure will not remove an already heavy buildup of dirt on Hot Section Rotors; it is intended to be used after the cleaning in paragraph 11 has been performed or on new (clean) engines, to prevent heavy buildup.

(7) Reposition sprayer so that spray tip is between combustion liner and midframc casing (fig. 7). Spray-wash entire area by rotating sprayer 360 degrees.

(8) Allow wash solution to soak the hot section parts for 10 minutes, then rinse the washed areas with clean water. Run the rinse water until clean water is observed running out the engine tailpipe. The rinse cycle can also be performed by connecting the wash cart to the compressor spray manifold (para 1-134.1, TM).

(9) Remove sprayer.

(10) Install igniter plug and ignition lead into either the 4 or 8 o'clock igniter plug port. Torque nut to 15° wrench arc.

(11) Run washed engines above ground idle for at least 5 minutes to dry out the engine flowpaths.

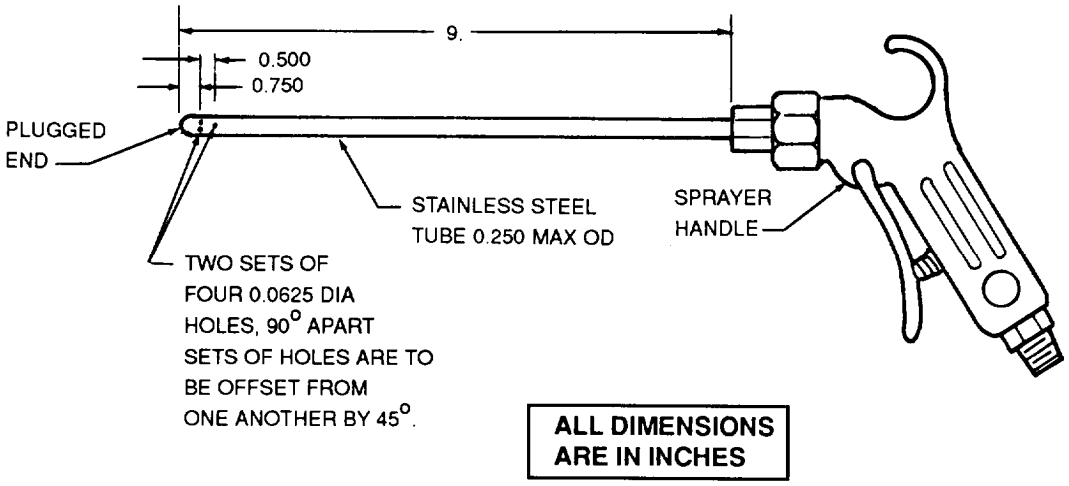

Figure 5. Hot Section Module Sprayer LMT 777.

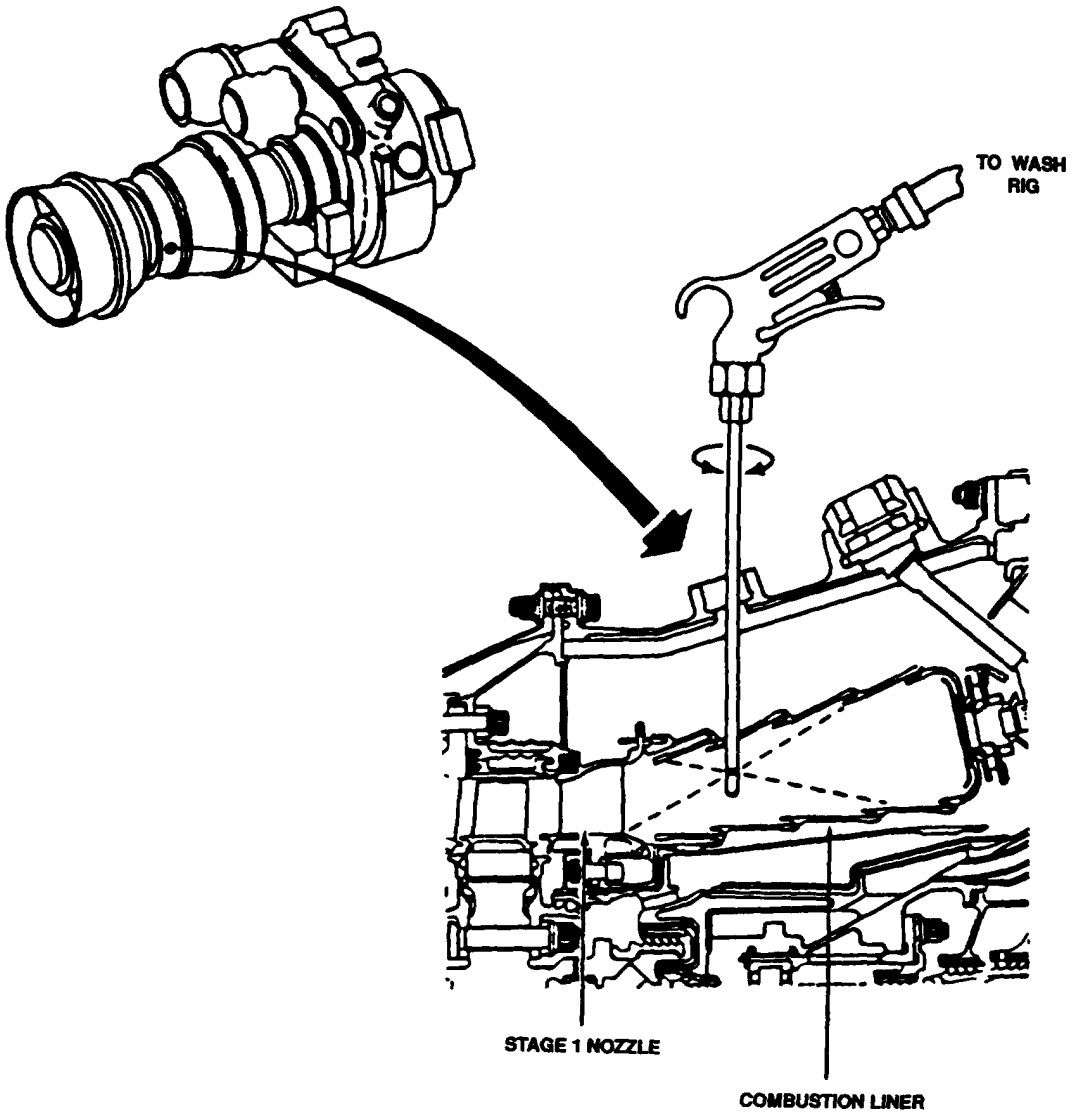

Figure 6. Washing Combustion Liner and Stage 1 Nozzle.