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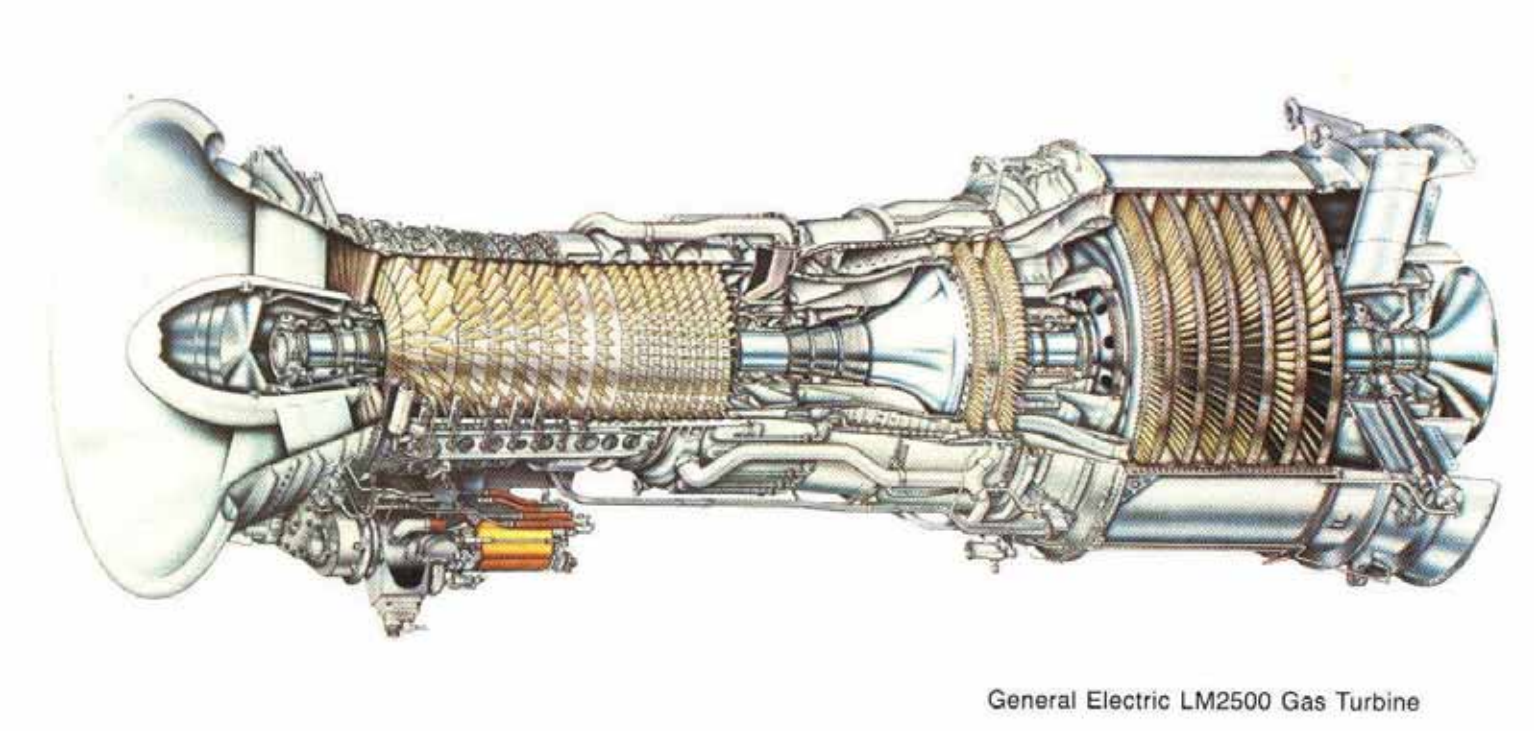
Fax: 44 (0) 151 525 5185
Website: www.tcturbines.com



General Electric LM2500 Gas Turbine

LM2500 SAC
Borescope Inspection
UNIT TM42

CUST –

ENGINE SERIAL NUMBER:
481-757

TCT SALES ORDER NUMBER:
UK9000087

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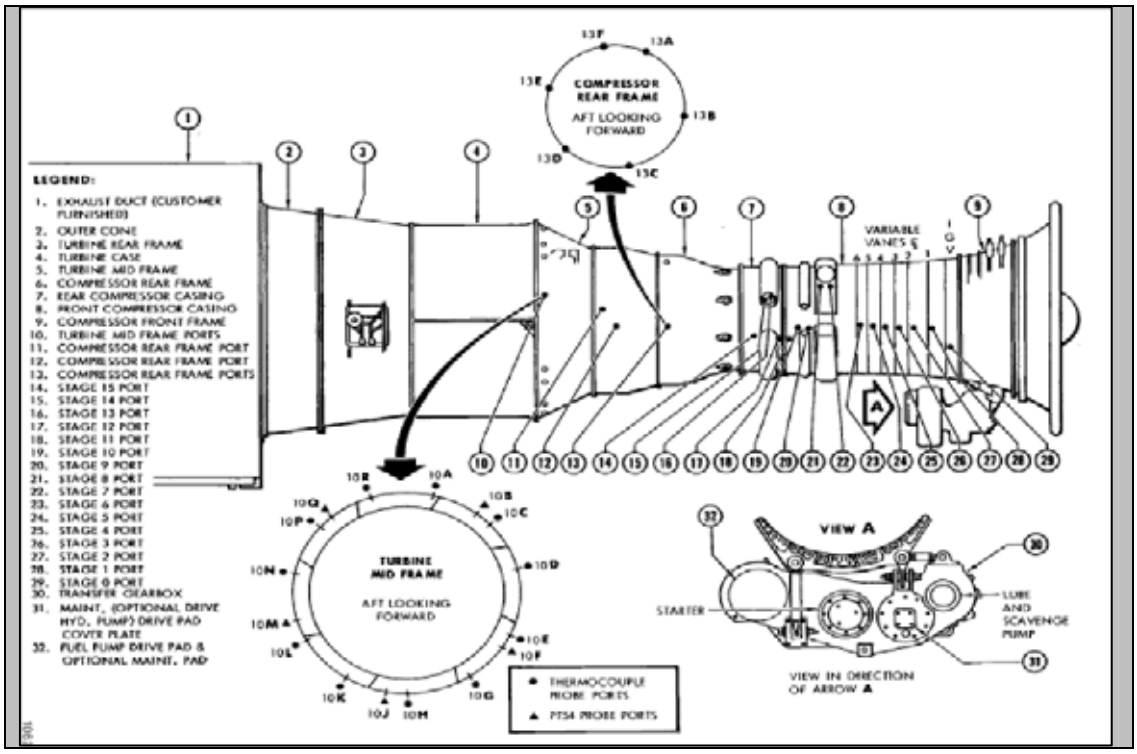
LM2500 SAC BORESCOPE REPORT	
Location:	Dar ES Salaam, Tanzania
Purchase order:	TBC, W/O UK80000157
Date of visit:	13-18 May 2008
Purpose:	Borescope inspection in accordance with GEK 97310, Vol. 1, Table 5-4 to Table 5-11
Purpose:	Lube and Scavenge Pump Inlet Screens Inspection and Cleaning in accordance with GEK 97310, Vol. 1, Table 5-3.18
Written by:	Mark Devine
Engine hours:	1281.28
Starts:	N/K
Fuel type:	Dual
Overview:	Engine is acceptable for further operation.



BORESCOPE ACCESS PORT LOCATIONS.

Volume 1, Tbl 5-4 – Tbl 5-11	LM2500 SAC Borescope inspection

COMPRESSOR:

Component	Condition
Stages 1 through 9 Blades	• Stage 3 blades, no damage found. • Stage 4 blades, no damage found. • Stage 9 blades, no damage found. • Acceptable in accordance with GEK 97310 Vol. 1 table 5-4.

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Stages 10 through 16 Blades	• Stage 10 blades, no damage found. • Stage 15 blades, no damage found. • Stage 16 blades, no defects found. • Acceptable in accordance with GEK 97310 Vol. 1 table 5-4.
Tip clanging contact stages 3-6	• No defects found. • Acceptable.
Stator Vanes (all)	• No defects found. • Acceptable.
All VSV Vanes	• No defects found. • Acceptable.
HPC Rotor and Stator Airflow Path Surfaces	• Normal levels of dirt/corrosion present. • Acceptable.

Reference Photographs - HPC Blades and Vanes

Stg 10 blade condition.

Stg 16 blade condition.

Inspection References: GEK 97310 Vol. 1, Table 5-4 Compressor Blades and Vanes, paragraph 5-3.6 and figures 5-8, 5-9 and 5-10.

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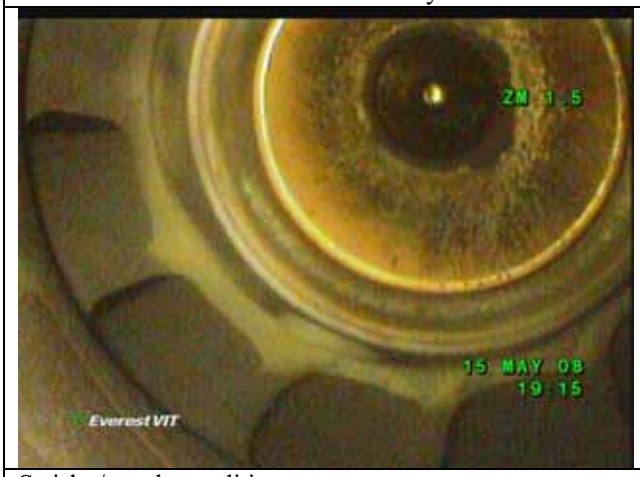
COMBUSTOR and FUEL NOZZLES:

Component	Condition
All Combustor Surfaces	• General condition good.
Dome Band/Dome Plate	• Very minor thermal barrier coating loss/degradation-acceptable
Riveted Joints	• No defects found
Trumpet and swirler cups	• Very minor thermal barrier coating loss/degradation-acceptable.
Dome Assembly	• No defects found
Igniter Ferrule	• No defects found
Combustor Cowl	• No defects found
Inner and Outer Liner	• No defects found
Fuel nozzle	• 3 fuel nozzles were removed from engine for inspection. #10 pos S/N PHCHN973, #11 pos S/N PHCHN846, #21 pos S/N PHCHN846. • Condition satisfactory

Reference Photographs – Combustor, Pre-mixers

Combustor TBC condition satisfactory.

Swirler/nozzle condition.



Swirler/nozzle condition.

Fuel nozzle condition.

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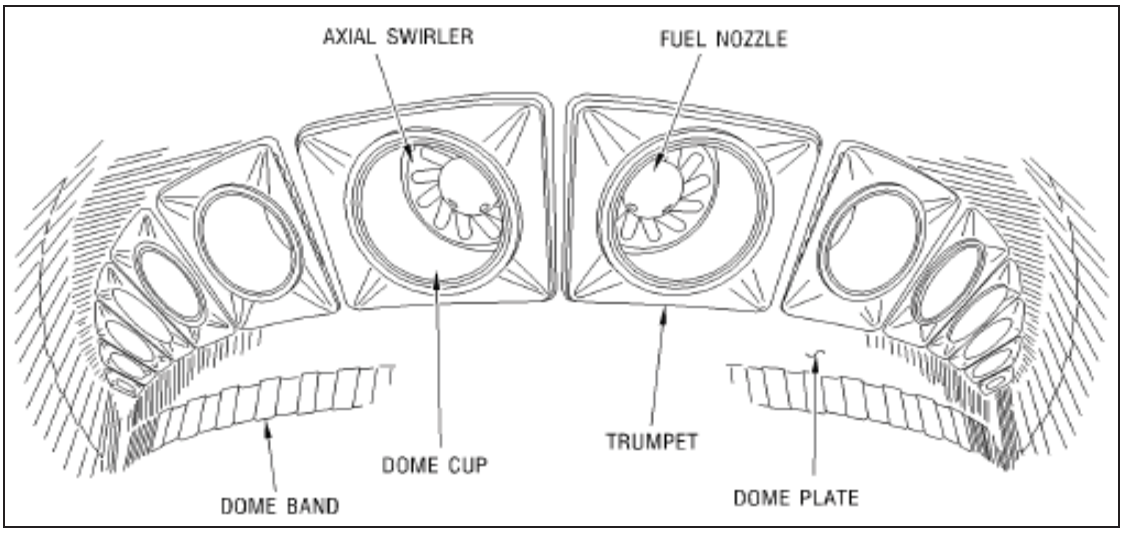
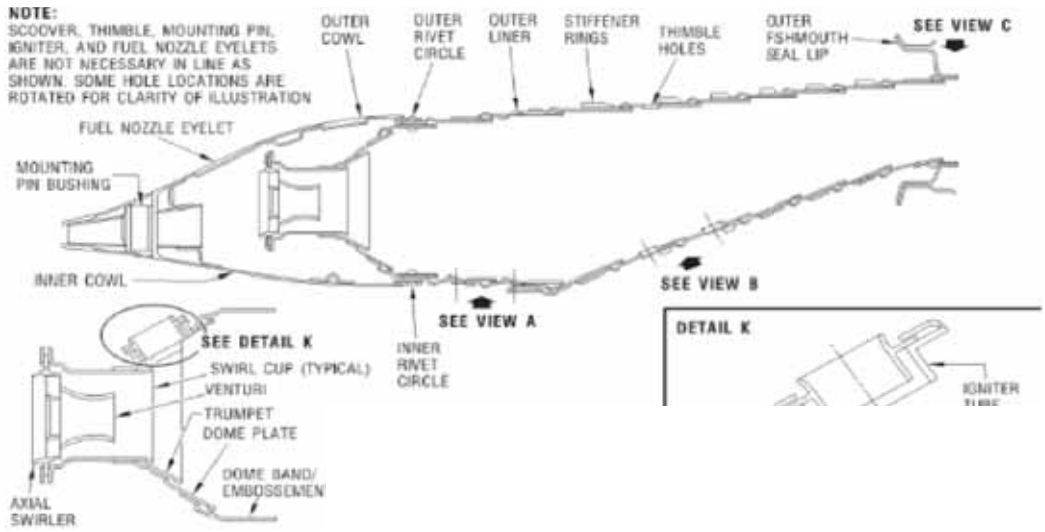
GEK 937310 Inspection References:





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HPT ASSEMBLY:

Component	Condition		
HPT Stage 1 Nozzle Assembly	**Defect**	**Location**	**Findings/GEK limits**
	Nozzle airfoil		
	N/A	N/A	No defects found in areas inspected
	Inner and Outer Platform		
	N/A	N/A	No defects found in areas inspected
	General remarks	Condition satisfactory for continued use.	
HPT Rotor Blade-Stage 1	**Defect**	**Location**	**Findings/GEK limits**
	HPT Rotor Blades-Leading Edge Area A		
	N/A	N/A	No defects found
	HPT Rotor Blades-Leading Edge Area B		
	N/A	N/A	No defects found
	HPT Rotor Blade Tips		
	N/A	N/A	No defects found
	HPT Rotor Blade-Trailing Edge Area A		
	N/A	N/A	No defects found
	HPT Rotor Blade-Trailing Edge Area B		
	N/A	N/A	No defects found
	HPT Rotor Blade-Concave Surface Area A		
	N/A	N/A	No defects found
	General remarks	Condition satisfactory for continued use	
HPT Stages 1 and 2 Nozzle Shroud	**Defect**	**Location**	**Findings/GEK limits**
	N/A	N/A	No defects found in areas inspected
	General remarks	Condition satisfactory for continued use	
HPT Stage 2 Nozzle Assembly	**Defect**	**Location**	**Findings/GEK limits**
	N/A	N/A	No defects found in areas inspected
	General remarks	Condition satisfactory for continued use	
HPT Rotor Blade-Stage 2	**Defect**	**Location**	**Findings/GEK limits**
	HPT Rotor Blades-Leading Edge Area A		
	N/A	N/A	No defects found
	HPT Rotor Blades-Leading Edge Area B		
	N/A	N/A	No defects found
	HPT Rotor Blade Tips		
	N/A	N/A	No defects found
	HPT Rotor Blade-Trailing Edge Area A		
	N/A	N/A	No defects found
	HPT Rotor Blade-Trailing Edge Area B		
	N/A	N/A	No defects found
	HPT Rotor Blade-Concave Surface Area A		
	N/A	N/A	No defects found
	General remarks	Condition satisfactory for continued use.	
HPT Stage 2 Nozzle Shroud	**Defect**	**Location**	**Findings/GEK limits**
	N/A	N/A	No defects found in areas inspected
	General remarks	Condition satisfactory for continued use	

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Reference Photographs – HPT assembly

		
Stg 1 Nozzle condition satisfactory.		Stg 1 Nozzle condition satisfactory.
		
Stg 1 Blade T/E condition satisfactory.		Stg 2 Blade L/E condition satisfactory.

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PACKAGE INSPECTION RECORD:

Component	Condition
Lube and Scavenge Pump Inlet Screens Inspection.	• B sump screen, minor contamination not metallic. • AGB screen, minor contamination x 1 metallic shard. • Acceptable
Gas Turbine External Inspection.	• Stud loose x 2 on power turbine stator case. Unable to tighten without risk of damage/shearing stud. Monitor for continued security, acceptable for continued use. • Thermocouple found U/S at position 10R. • PT54 probe port plug found U/S at position 10M.

U/S PT54 probe port plug.

U/S thermocouple.

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Recommendations	Borescope inspection

- Engine condition satisfactory for continued use
- Replace U/S plug, P/N 9103M46P01, Ref GEK50336 Fig 51 item 5 (quote to follow)
- Dowans to replace U/S thermocouple with own stock.
- Lubricate the loose LPTS locks in hopes to tighten in situ, if not find suitable application to retain assembly to minimize case damage.
- Customer has reported a higher hate rate/low power compared to the other units. The following steps are recommended
    - Inlet inspection
    - Inspection of filtration system (to include differential pressure reading and ensure instrumentation is calibrated) – Air inlet temperature (TE-1482) is high
    - Perform device inspection and calibration as required
    - Inspect for on engine pipe leaks
    - Perform VSV system inspection checks in accordance GEK 97310 Vol. 2 WP118 00 and WP 206 00 – recommend full system (VIGV – HP6)
    - Compare Customer trend data – has this issue increased since installation?

Questions to be answered by customer

- Last time all devices have been calibrated
- Last time fuel metering valve was inspected calibrated
- Has there been a gradual increase to heat rate?

Parts used during outage:

Parts used			
Part #	**Component Description**	**Source**	**Issued**
C10-218	SAFETY-CABLE W/FERRULE	NEW	25
4058T39PO1	GASKET	NEW	3
M83248/1-121	PREFORMED PACKING	NEW	1
J221P910	PREFORMED PACKING	NEW	2
J221P912	PREFORMED PACKING	NEW	3
J221P905	PREFORMED PACKING	NEW	5

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Customer supplied information