

AD-A131 633

150 HOUR ENGINE TEST OF CORROSION INHIBITED  
MIL-L-23699C OIL(U) ARMY TSARCOM DEPOT ENGINEERING  
SUPPORT BRANCH CORPUS CHRISTI A... B G WILSON JUN 83

1/1

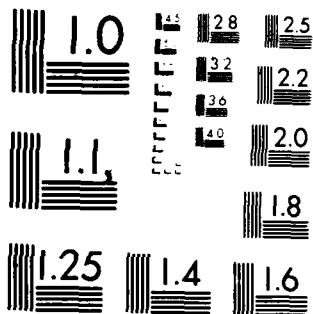
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MRDP-6297-1

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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963-A



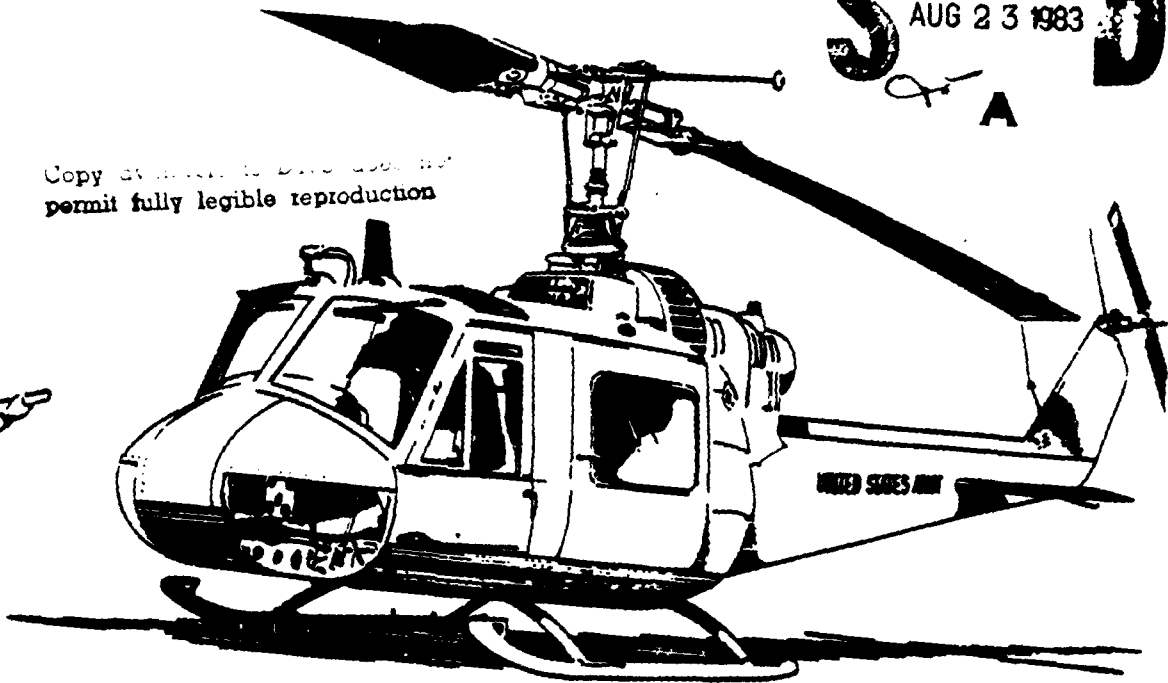
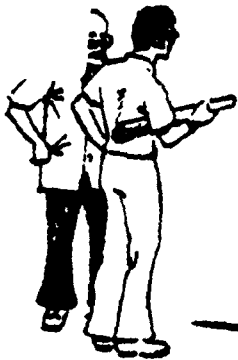
(12)

# RCM AND DEPOT ENGINEERING SUPPORT DIVISION

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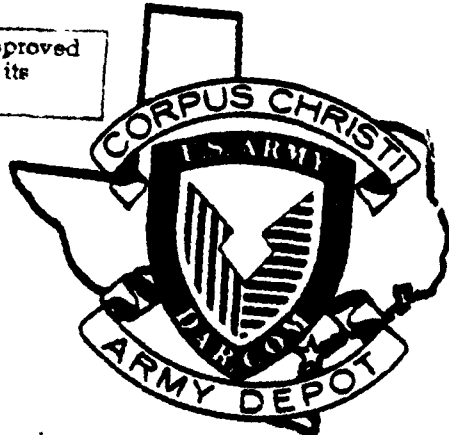
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## DEPOT ENGINEERING SUPPORT BRANCH at CCAD



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133-1-1-P

PURPOSE:

To provide results of engine test on a modified version of MIL-L-23699C Oil (MERADCOM is the proponent for this test).

BACKGROUND:

1. This office conducted a 150 hour qualification at CCAD, during the period 16 through 29 January 1981, using a T53-L-13B engine in a CCAD Test Cell.

2. The primary objectives of the test was to evaluate MIL-L-23699 oil with a corrosion inhibitor additive (prepared by MERADCOM) and to qualify a new vendor source for First and Second Stage Gas Producer Turbine Blades. Several repairs to parts were also being evaluated. This report will address the test oil only.

3. The CCAD Test Cell Lubrication System is massive in comparison to an Aircraft Lubrication System such a system could not produce realistic test results. A simulated aircraft lubrication system was designed, fabricated, and used to recently engine test an on-line ferrograph analyzer. This system was patterned after the UH-1H aircraft, having the same oil capacity and using the same oil cooler and oil tank. See Appendix A for further details. The simulated aircraft lubrication system was used during the 150 hour qualification test. See Appendix A.

TEST PLAN:

1. The 150 hour qualification test was conducted in accordance with Lycoming Test Specification XT5313.4c with the following changes:

a. Power setting were established where possible from TIT maximum limit rather than SFC.

b. Seven oil samples were taken during each six hour cycle of test and submitted to the laboratory for analysis.

c. The cycle time was changed to permit two shift operation without the two hour cool down time.

d. The engine testing was conducted manually as the test sequences required are not in the computer program. Only the initial calibration run at the beginning of the test and at the conclusion were computer runs. See Appendix B and C.

2. The Lycoming test specification is not included in the report but is available. It specifies engine loads and times to be run at each power setting. The test is more severe than would normally be experienced during aircraft operation. The PEI provides special instructions for CCAD during engine assembly, test and disassembly. See Appendix B.

#### TEST AND OBSERVATIONS:

1. The initial calibration of the engine indicated it would produce rated power at 99.07 NI speed and 1075°F MGT at standard day seal level condition which is average. Oil temperatures from the #2 and #3 bearing packages were normal. Oil consumption for the calibration run was zero. See Appendix C.
2. The first cycle of the test was run with no unusual problems. The engine at maximum power developed 1437 horsepower with a 48°F ambient. The bearing oil out temperatures were: #2 bearing package 354°F, #3 bearing package 331°F. These temperatures were obtained using the aircraft duplicated oil system. This system also uses bleed air from the engine to run the oil cooler blower fan.
3. The 150 hours of testing was performed with no unusual problems. There was no noticeable oil consumption, make up oil was added for that removed for laboratory testing. The engine vibration was normal and did not change during the test. Bearing oil temperatures during testing did not significantly increase.
4. The engine performance after completion of the 150 hour test had decreased slightly; it produced normal rated power with an NI speed of 99.7% and 1110°F MGT. This is well within normal degradation as the compressor picks up some oil and dust during operation which decreases compressor efficiency. See Appendix E.
5. Seven (7) oil samples were taken each six (6) hour cycle. These were carried to the laboratory and a spectrographic analysis run on each sample. There were no significant increases of any metals during the test. The results were discussed with the laboratory personnel. See Appendix F for an example.
6. A one quart sample was taken after 75 hours of the test was completed and also after 150 hours. These samples were sent to the laboratory with a request for foaming characteristics test per ASTM-D-892-72. The results are given in Appendix G.
7. The engine was disassembled after completion of the test and all parts laid out for inspection. Personnel from MERADCOM visited CCAD and inspected the gears, bearings and seals. All gears and bearings were in good condition with no unusual discoloration or wear. The seals did not indicate any abnormal wear or leakage. The number one seal which is the most likely to leak during test indicated no leakage and only a minor amount of coking.

#### ANALYSIS:

1. Tests showed no adverse affects in using this modified version of MIL-L-23699C, observations during test and after engine disassembly, indicated this modified oil functioned (cleaned, cooled, and lubricated) as good as the standard MIL-L-23699C oil. There was no unusual coking of seals or wear on gears or bearings.

2. This test did not address corrosion resistance. A comparative corrosion resistance test of the modified vs. standard MIL-L-23699 oils will be (or has been) conducted by MERADCOM. If further testing of the long range effects of this modified oil is desired, suggest Mr. Bill Masters, TSARCOM, be contacted at AV 693-3041. Mr. Masters can have the oil tested in aircraft at the test board (Fort Rucker, AL). This would provide the quickest method of extended service testing the modified oil.

## APPENDIX A

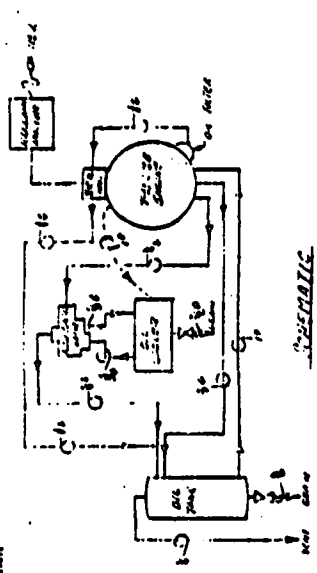
Duplication of UH-1H aircraft lubrication system in CCAD test cell.

1. The test cell lubrication system has a much greater quantity of oil than an aircraft lubrication system and has additional filtration. It also has temperature control for both heating and cooling to maintain a constant oil in temperature. To realistically test the characteristics of the modified MIL-L-23699C oil, it was decided to use a system developed for a previous project which duplicates the aircraft oil system. This system was designed and used during a ferrograph analyzer test.

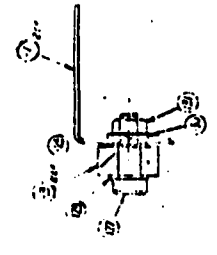
2. The design of a portable lubrication system that duplicates the UH-1H aircraft system, in both function and oil capacity (three gallons), was built. Figure 1 is a drawing of test cell installation; Figures 2 and 3 are photographs of test cell with engine installed; Figure 4 is the control room.

REVISIONS

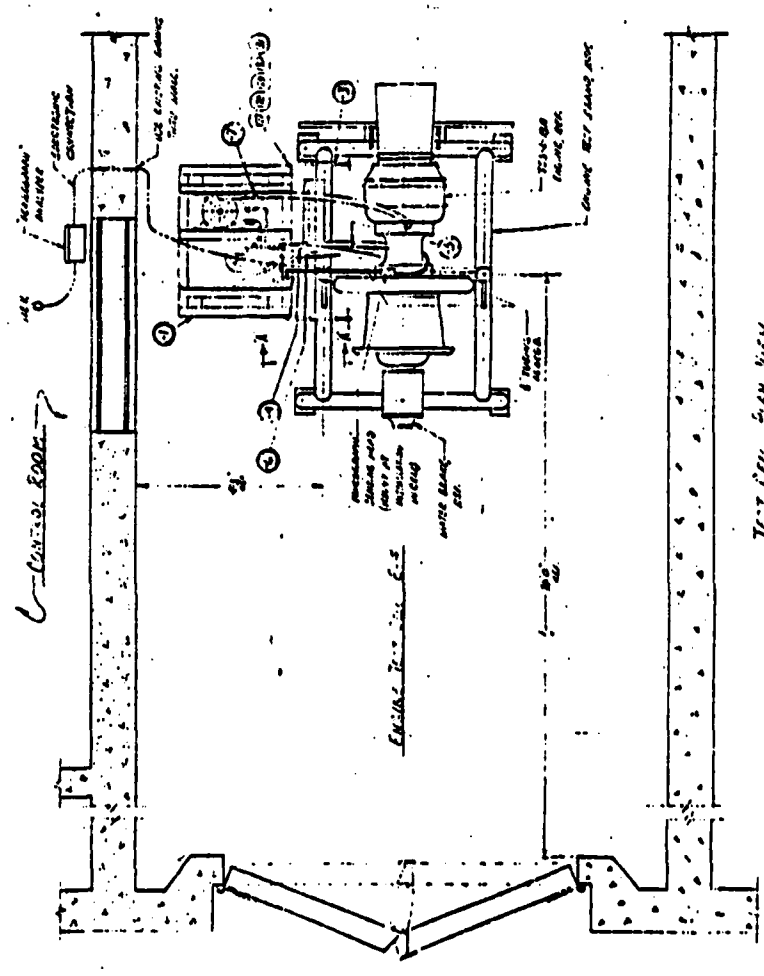
REV. 1



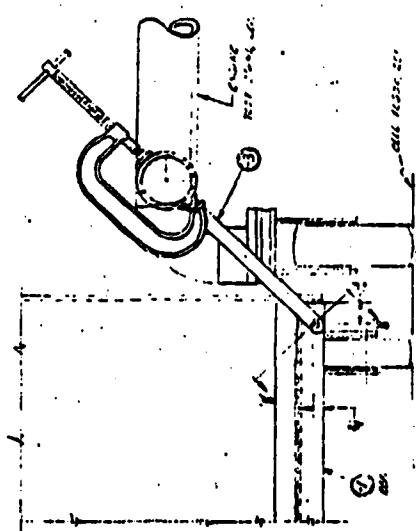
RESTRICTION



SECTION B-E  
SCALE 1/4" = 1'-0"



RESTRICTION



RESTRICTION

SECTION B-E		LIST OF MATERIALS	
NO.	QUANTITY	DESCRIPTION	REMARKS
1	1	MOTOR	
2	1	GEAR BOX	
3	1	SHAFT	
4	1	PULLEY	
5	1	BELT DRIVE	
6	1	WHEEL	
7	1	ROCKERS	
8	1	COUNTERS	
9	1	MOTOR	
10	1	GEAR BOX	
11	1	SHAFT	
12	1	PULLEY	
13	1	BELT DRIVE	
14	1	WHEEL	
15	1	ROCKERS	
16	1	COUNTERS	

RESTRICTION

FIGURE A

RESTRICTION

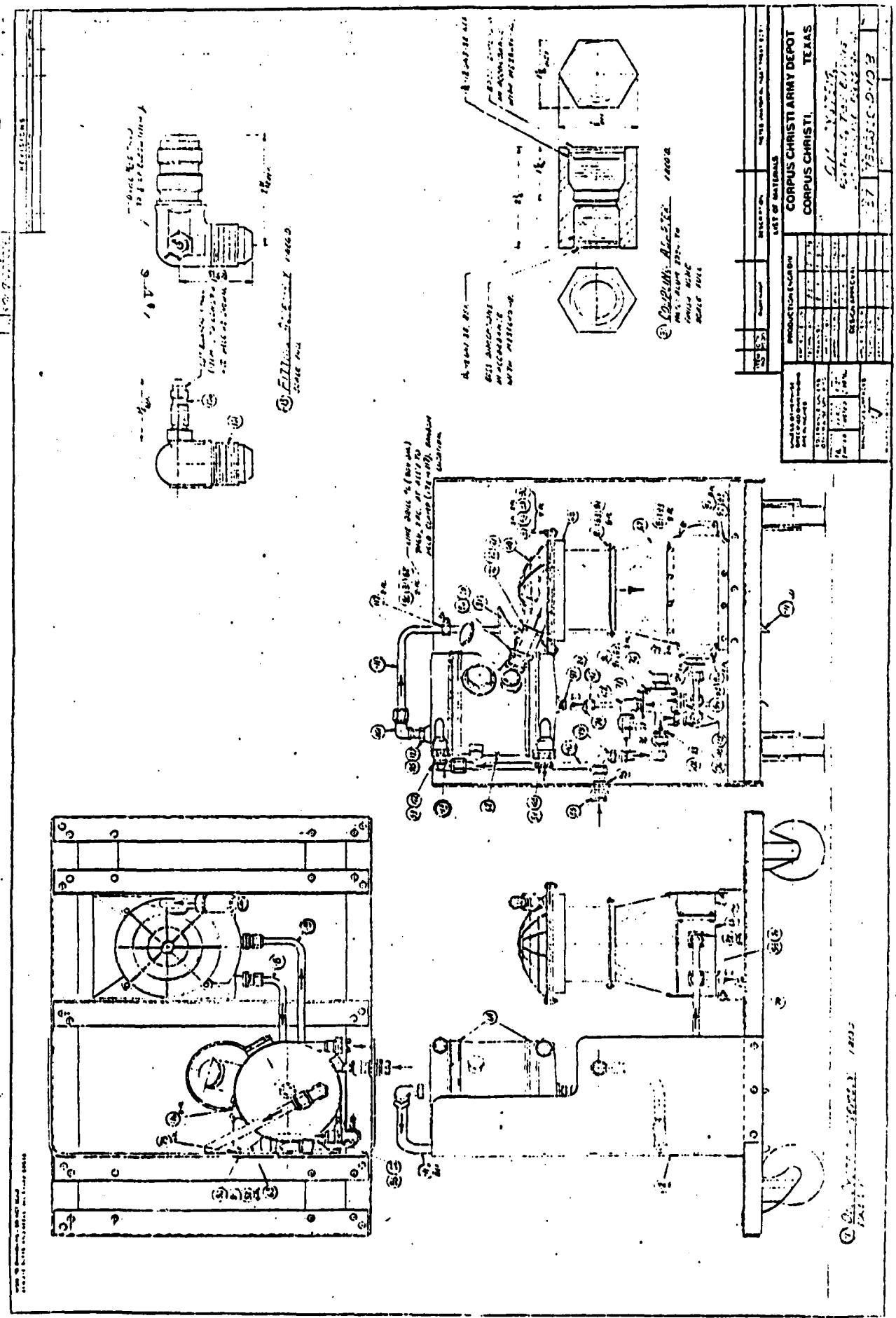
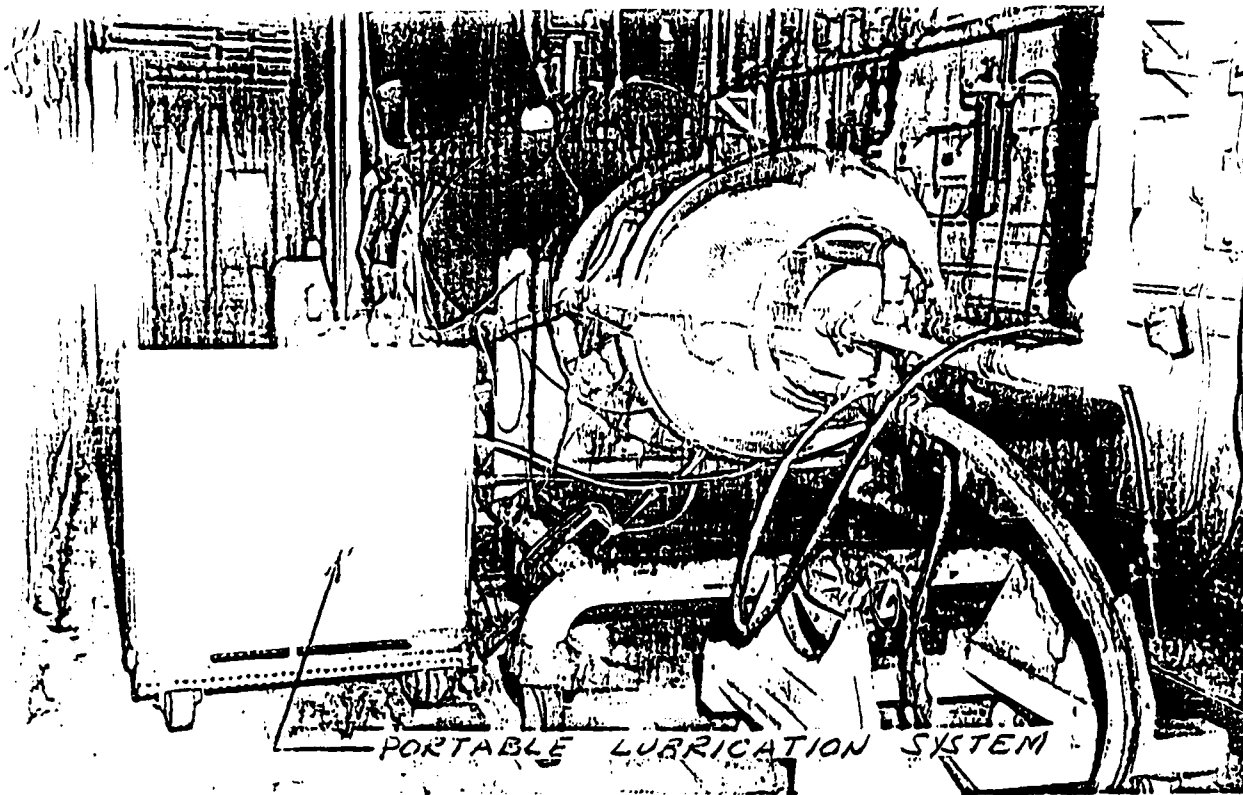


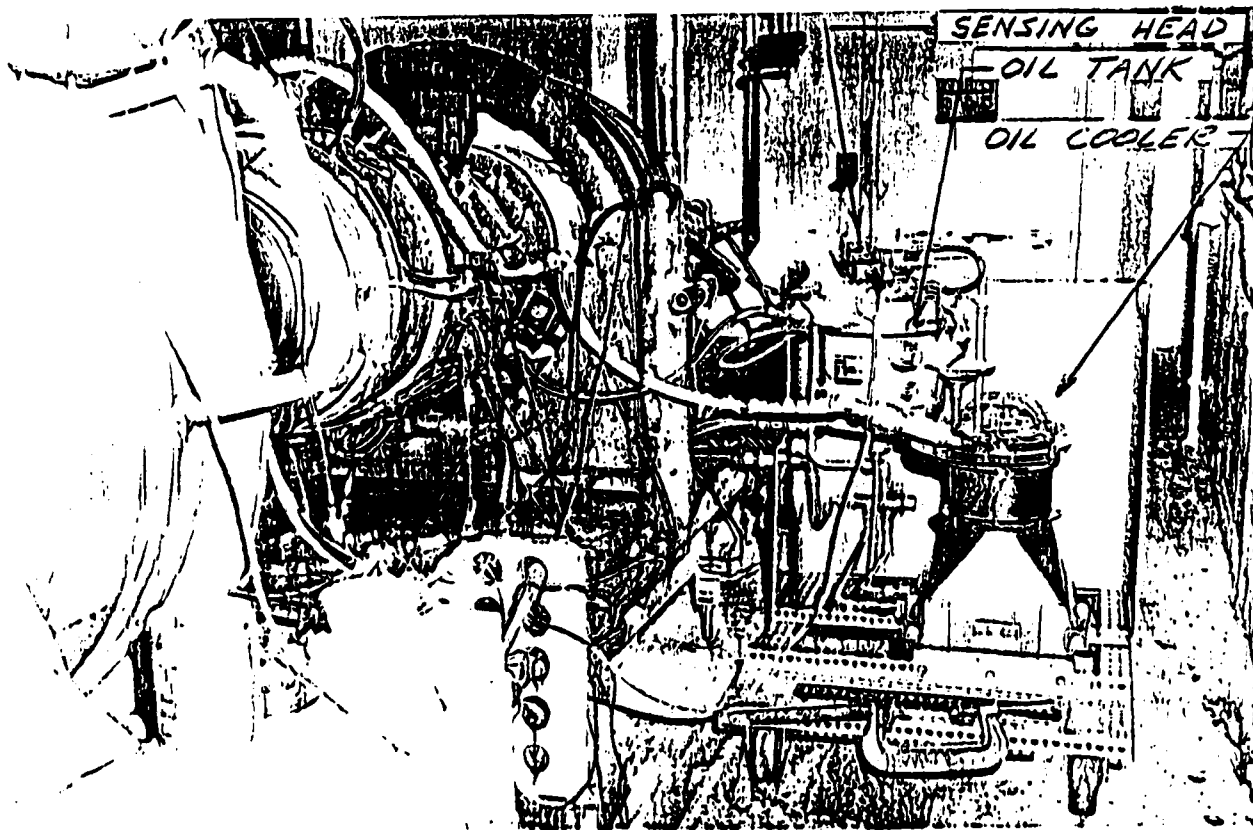
FIGURE A-1

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PORTABLE LUBRICATION SYSTEM

FIGURE A-2



SENSING HEAD  
OIL TANK  
OIL COOLER

FIGURE A-3

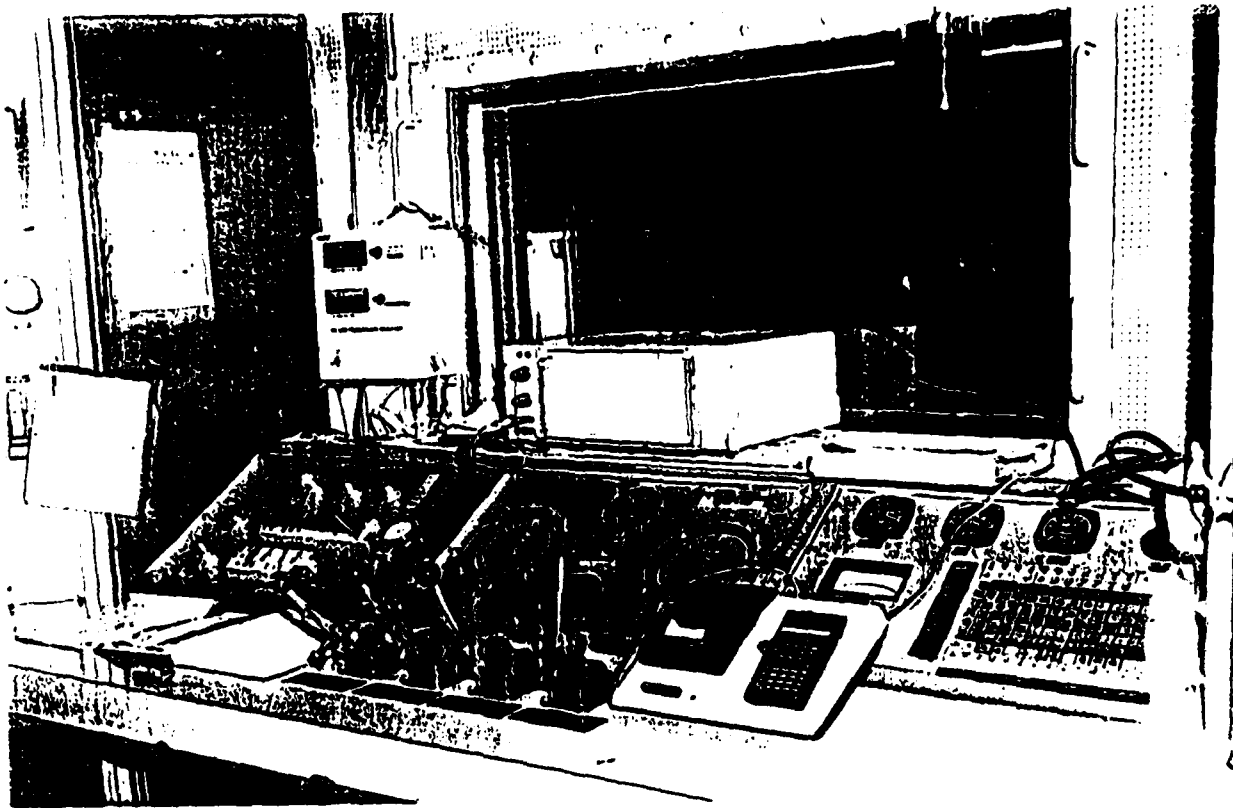


FIGURE A-4

Attachment B

<b>PROJECT ENGINEERING INSTRUCTION</b>		FILE CODE T53-T	PEI NR. MEEP-6299
PROJECT TITLE Assembly, Qualification Test and Dis- of T53-L13B Engine		PAGE 1 of 2	DATE 08 Sep 80
PROJECT TITLE Qualification of Turbine Engine Blades (MEEP-6297)		REASON FOR PROJECT	
PREPARED BY BILLY G. WILSON <i>Billy Wilson</i>		OFFICE SYMBOL DRSTS-MEEP	TELE. EXT. 4232/3414

STATEMENT OF WORK:

1. Assemble and test T53-L13B engine S/N K-117 per following instructions using the simulated oil system developed in project MEEP-5477.
2. The oil system will be disassembled and all parts cleaned and flushed.
3. Reassemble oil system and cap all lines.
4. Disassemble test engine as required to replace all main shaft seals and install the test parts listed below:
  - a. Steel impeller housing P/N 1-101-370-03.
  - b. 1st stage sealing disc P/N 1-100-135-03.
  - c. 1st and 2nd stage gas producer turbine blades.
5. First and second stage gas producer turbine wheels will have half test blades and half new blades from supply. Blades will be weighed and paired such that the test blades and the new blades are alternately placed in each turbine disc.

NOTE

If test blades do not have any special markings for identification they will be identified using a vibropeen marker. An "A" will be marked on the forward face of the root area.

6. A 150 hour qualification test will be conducted in accordance with Lycoming Specification XTS 313.4.1C with the following special instructions:
  - a. Power settings will be established where possible from TIT maximum limit rather than SFC.
  - b. Oil sample will be submitted to the laboratory at the end of each work shift. (Approximately six (6) hours of engine operation). Samples will be numbered and records maintained to show operation time at each sample. Laboratory will provide spectrographic report on each sample and overall analysis at the end of test.

*Small*

7. Two quarts of oil will be taken from lubrication system, immediately upon completion of test, and prepared for shipment.
8. Test engine will be disassembled to allow evaluation of main shaft seals and turbine blades.
9. Test blades (as received from manufacture) will be dimensionally and metalurgically checked by the laboratory. A report is required. Further laboratory assistance will be required to evaluate the tested blades.



WILLETT H. HAGGERTY

Chief, TSARCOM Engr Spt Br @ CCAD

# APPENDIX C-1

RIN: 1026-J30024Z

GAS TURBINE ENGINE TEST LOG SHEET

PRINTED 07/06/81 19 25 54 PAGE 1 OF 2

TEST ACTIVITY  
 CORPUS CHRISTI ARMY DEPOT SER. NO. SPLST STAND NO. 04 PRE-01 81016 OPERATORS GARCIA, E. (Operator)  
 CORPUS CHRISTI, TEXAS SEG. NO. 0322-1999 TEST NUMBER 1 REJECTID 81016 GONZALEZ, S. G. (Operator)  
 TYPE TEST: RINOR TYPE/MOD. T53-L138 RUN TIME 3 07 INSPECTOR NUMBER

PUR SETTING	GI	FA	B/B	75%	MRP	MRP	MIL
MODE OF DAY	M	M	M	M	M	M	
ELAPSED TIME	1337	1345	1166	1229	1321	1315	
PWR LVR ANGLE	25	40	60	100	100	100	
N1 SPEED REF	51.0	66.6	81.3	93.1	97.2	97.2	
N2 SPEED	27.3	44.5	71.7	92.5	96.7	98.9	
LOAD	1096	1870	3446	10950	90.3	94.6	
SWP TARGET	40	110		904	1232	1400	
SWP ACTUAL	31	87	257	920	1240	1418	
SWP REFERRED				902	1219	1396	
MGT ACTUAL	696	689	697	976	1046	1083	
MGT REFERRED				957	1032	1074	
TIT ACTUAL				1538	1660	1724	
TIT REFERRED				1511	1640	1712	
COMP IN TEMP	64	66	69	66	64	62	
COMP OUT TEMP	190	269	365	490	525	540	
OIL IN TEMP	190	192	196	196	197	196	
OIL TEMP PULB	193	194	196	195	198	197	
Oil. Oil Temp	202	203	206	224	230	234	
Oil. Inlet Temp	234	246	267	337	343	356	
Oil. Inlet Temp	231	243	267	314	314	323	
Fuel In Temp	65	65	65	65	65	65	
TURBOINLET	5.3	6.7	15.5	50.0	60.3	65.5	
GEARBOX PRESS	1	1	3	7	8	9	
OIL IN PRESS	3.0	3.0	2.8	2.6	2.0	2.0	
OIL SCAV PRES	32.0	51.0	55.0	56.0	57.0	56.0	
FLTR OUT PRES	43.0	65.0	70.0	67.0	66.0	69.0	
TURBO BOOST	123	126	143	131	134	135	
FUEL IN PRESS	34	34	29	34	32	32	
FUEL PUMP #1	285	325	355	400	452	508	
FUEL PUMP #2	265	325	355	400	462	508	
FUEL MAN PRES	11	25	65	215	305	365	
BAROMETER	30.30	30.30	30.30	30.30	30.30	30.30	
BURNER PRESS	22	41	78	145	169	178	
B/W DELTA PRESS	1.2	2.1	3.9	10.3	12.4	13.4	
FUEL FLOW	136	263	355	619	749	820	
FUEL FLOW REF				607	736	807	
ENG FUEL FLOW		119				690	
OIL FLOW	2165	2710	3090	3165	3190	3205	
VIBRATION #1	.20	.20	.40	.30	.20	.20	
VIBRATION #2	.30	.50	1.00	.40	.30	.60	
VIBRATION #3	.60	.60	4.20	3.70	2.10	2.20	
VIBRATION #4	.20	.20	.30	.30	.30	.30	

THIS ENGINE WILL PRODUCE RATED POWER AT 99.0ZMI SPEED, 1075F/574C MET, AND 60.0 PSI TORQUE AT STANDARD DAY SEA LEVEL COND.  
 ANY QUESTIONS CONCERNING THIS ENGINE LOG SHEET MAY BE DIRECTED TO AUTODIN 851-2651/3954.

PRINTED 09/06/81, 10:27:59 PAGE 2 OF 2

OIL MIL-1-23699 FUEL MIL-J-5624 JP-4  
SPECIFIC GRAVITY @ 60° 749

GAS TURBINE ENGINE TEST LOG SHEET

SEQ. NO. 0322-1999 REC. NO. 1 O/V S/N 662AM5011 F/C S/N 662AS126  
10 LIMIT MODIFICATION @ M

RUN 102R300242

SER. NO. SPLITST CURVE TECH DATA SET 9 LIMIT TECH DATA SET

S/S START STOP START STOP START STOP

MGT 947 687

ET 27.1 65.3 23.0 43.5

TOD 1007 1130 1206 1350

NEED BAND OPENS AT ZHI ZMII TEMP WF PR TOD ET

80.3 63.6 65 330 68 1106 :05

OS GOV STOPS HIGH WF ZMII LOU WF ZMII TOD ET

814 100.5 508 76.0 1231 :01

IGV CHECKS ZMI WF TEMP TOD ET

A. 79.3 293 66 BEGINS TO OPEN 1214 :05

B. 94.2 650 65 FULLY OPEN

C. 93.6 633 65 BEGINS TO CLOSE

D. 78.6 278 66 FULLY CLOSED

E. 79.3 293 66 BEGINS TO OPEN

ACCEL CHECKS ZMI SECS EGT TOD ET

F1 TO 98.1 7.6 1144 1324 :06

F1 TO 98.1 3.3 1005

VIB	ZMI	ZMII	V1	V2	V3	V4	TOD	ET
75.0	75.0	.36	.50	2.50	.30	1106	:04	
80.0	80.0	.20	.50	2.60	.30			
85.0	97.3	.30	.60	2.60	.40			
90.0	94.8	.20	.60	2.30	.40			
90.0	97.3	.30	.60	2.30	.30			
95.0	100.4	.20	.50	2.10	.30			
95.0	97.3	.30	.60	2.30	.30			
98.0	97.3	.20	.40	2.60	.30			

OIL CONSUMPTION .006 PPH

ANTI-ICE OPERATION 46.0 PSI

ANTI-ICE CUSTOMER AIR CHECK OK

WAVE-OFF NET WITH 20.5 IN. H2O ON P1 OK

PRV INITIAL SETTING 3.0 PRV FINAL SETTING 3.0

IGV ACTUATOR ROD ADJUSTMENT NONE

ANY QUESTIONS CONCERNING THIS ENGINE LOG SHEET MAY BE DIRECTED TO AUTOVDN 661-2651/3954.

UNIT		DATE		TIME		LATITUDE		LONGITUDE		SPEED		DIRECTION		STATUS		REMARKS	
NO.	NAME	MO.	DAY	HOUR	MIN.	DEG.	MIN.	DEG.	MIN.	KTS.	DEG.	DEG.	DEG.	DEG.	DEG.	DEG.	DEG.
1	USSC	10	15	08	00	110	00	110	00	10	000	000	000	000	000	000	000
2	USSC	10	15	08	05	110	05	110	05	10	000	000	000	000	000	000	000
3	USSC	10	15	08	10	110	10	110	10	10	000	000	000	000	000	000	000
4	USSC	10	15	08	15	110	15	110	15	10	000	000	000	000	000	000	000
5	USSC	10	15	08	20	110	20	110	20	10	000	000	000	000	000	000	000
6	USSC	10	15	08	25	110	25	110	25	10	000	000	000	000	000	000	000
7	USSC	10	15	08	30	110	30	110	30	10	000	000	000	000	000	000	000
8	USSC	10	15	08	35	110	35	110	35	10	000	000	000	000	000	000	000
9	USSC	10	15	08	40	110	40	110	40	10	000	000	000	000	000	000	000
10	USSC	10	15	08	45	110	45	110	45	10	000	000	000	000	000	000	000
11	USSC	10	15	08	50	110	50	110	50	10	000	000	000	000	000	000	000
12	USSC	10	15	08	55	110	55	110	55	10	000	000	000	000	000	000	000
13	USSC	10	15	09	00	110	00	110	00	10	000	000	000	000	000	000	000
14	USSC	10	15	09	05	110	05	110	05	10	000	000	000	000	000	000	000
15	USSC	10	15	09	10	110	10	110	10	10	000	000	000	000	000	000	000
16	USSC	10	15	09	15	110	15	110	15	10	000	000	000	000	000	000	000
17	USSC	10	15	09	20	110	20	110	20	10	000	000	000	000	000	000	000
18	USSC	10	15	09	25	110	25	110	25	10	000	000	000	000	000	000	000
19	USSC	10	15	09	30	110	30	110	30	10	000	000	000	000	000	000	000
20	USSC	10	15	09	35	110	35	110	35	10	000	000	000	000	000	000	000
21	USSC	10	15	09	40	110	40	110	40	10	000	000	000	000	000	000	000
22	USSC	10	15	09	45	110	45	110	45	10	000	000	000	000	000	000	000
23	USSC	10	15	09	50	110	50	110	50	10	000	000	000	000	000	000	000
24	USSC	10	15	09	55	110	55	110	55	10	000	000	000	000	000	000	000
25	USSC	10	15	10	00	110	00	110	00	10	000	000	000	000	000	000	000
26	USSC	10	15	10	05	110	05	110	05	10	000	000	000	000	000	000	000
27	USSC	10	15	10	10	110	10	110	10	10	000	000	000	000	000	000	000
28	USSC	10	15	10	15	110	15	110	15	10	000	000	000	000	000	000	000
29	USSC	10	15	10	20	110	20	110	20	10	000	000	000	000	000	000	000
30	USSC	10	15	10	25	110	25	110	25	10	000	000	000	000	000	000	000
31	USSC	10	15	10	30	110	30	110	30	10	000	000	000	000	000	000	000
32	USSC	10	15	10	35	110	35	110	35	10	000	000	000	000	000	000	000
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35	USSC	10	15	10	50	110	50	110	50	10	000	000	000	000	000	000	000
36	USSC	10	15	10	55	110	55	110	55	10	000	000	000	000	000	000	000
37	USSC	10	15	11	00	110	00	110	00	10	000	000	000	000	000	000	000
38	USSC	10	15	11	05	110	05	110	05	10	000	000	000	000	000	000	000
39	USSC	10	15	11	10	110	10	110	10	10	000	000	000	000	000	000	000
40	USSC	10	15	11	15	110	15	110	15	10	000	000	000	000	000	000	000
41	USSC	10	15	11	20	110	20	110	20	10	000	000	000	000	000	000	000
42	USSC	10	15	11	25	110	25	110	25	10	000	000	000	000	000	000	000
43	USSC	10	15	11	30	110	30	110	30	10	000	000	000	000	000	000	000
44	USSC	10	15	11	35	110	35	110	35	10	000	000	000	000	000	000	000
45	USSC	10	15	11	40	110	40	110	40	10	000	000	000	000	000	000	000
46	USSC	10	15	11	45	110	45	110	45	10	000	000	000	000	000	000	000
47	USSC	10	15	11	50	110	50	110	50	10	000	000	000	000	000	000	000
48	USSC	10	15	11	55	110	55	110	55	10	000	000	000	000	000	000	000
49	USSC	10	15	12	00	110	00	110	00	10	000	000	000	000	000	000	000
50	USSC	10	15	12	05	110	05	110	05	10	000	000	000	000	000	000	000

Report of Incident  
 Report of Loss  
 Report of Damage  
 Report of Other

UNIT NO. 100  
 DATE 10/15/50  
 TIME 0800  
 LATITUDE 110 00  
 LONGITUDE 110 00  
 SPEED 10  
 DIRECTION 000

NAME OF VESSEL  
 TYPE OF VESSEL  
 HOME PORT  
 OFFICER IN CHARGE  
 COMMANDER

REPORT MADE AT  
 DATE  
 TIME  
 BY

APPENDIX D-1

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RIN T02RJ00104Z

GAS TURBINE ENGINE TEST DISCREPANCIES

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SER. NO. SPLITST SER. NO. 0322.1999 RUN NO. 1 RUN DATE 61016  
 DISCREPANCY BASIC S/S GI FI 75Z NSFP MAX MIL ACC/MO DCN B/W IGV CUT VIB DSC SPL  
 UNLISTED DISCREPANCY 267 X

*SII 9 June 81 041610Z UNK POWR*

DATE OF TEST 61016 GAS TURBINE ENGINE PERFORMANCE ANALYSIS RIN T02RJ0034Z  
 153-L13

	ZNI	WF	PR	WA	TIT	NET	WA/WF	WA/NI	DT/WA	PB/WA	CONPE
ACTUAL	93.1	619	5.79	10.44	1536	976	60.71	6.73	40.61	13.69	.802
936 HP	93.0	621	5.86	10.50	1525	985	60.66	6.77	40.19	13.96	.806
STB LIM		425									
PCT DEV	.53-	1.97	1.01-	2.42-	2.14	1.15	4.26-	2.03-	1.69-	1.16	1.64
ACTUAL	97.2	749	6.56	11.96	1668	1046	55.17	7.09	40.16	14.72	.823
1460 HP	97.0	747	6.56	11.43	1652	1039	55.06	7.07	40.07	14.61	.822
STB LIM		750			1659	1098					
PCT DEV	.51-	1.00	1.79-	2.09-	1.85	1.76	3.92-	2.35-	.79-	.76	.98
ACTUAL	99.2	820	6.87	11.96	1724	1063	52.50	7.23	39.97	14.68	.825
1600 HP	99.0	809	6.95	11.68	1714	1075	52.66	7.20	40.07	14.96	.828
STB LIM	101.0	812			1720	1120					
PCT DEV	.50	.87	1.84-	3.10-	1.72	2.09	3.94-	2.57-	.27-	1.01	.65
1.000	1.000	.996		.998	1.000	1.000					

SER. NO. 0322.1999 SER. NO. SPLITST CELL NO. 04 RUN NO. 1  
 GP1X .00 GP2X .00 PT1X .00 PT2X .00  
 CORRELATION COEFFICIENTS

REQUEST FOR AND RESULTS OF TESTS

PAGE NO. NO. OF PAGES

SECTION A - REQUEST FOR TEST

1 TO: (Include ZIP Code)		2 FROM: (Include ZIP Code) WPA/ALABAMA ENGINE DIVISION ENGINE ASSEMBLY BRANCH		
3 VENDOR CONTRACTOR AND ADDRESS (Include ZIP Code)		4 MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code) WPA/ENGINE BRANCH		
5 CONTRACT NUMBER		6 P.O. NUMBER		
7 END ITEM AND/OR PROJECT		8 SAMPLE NUMBER	9 LOT NO	8. REASON FOR SUBMITTAL SPECTROGRAPHIC OIL ANAL- YSIS, QUAD REG 750-1
10 MATERIAL TO BE TESTED	10a. QUANTITY SUBMITTED	11 QUANTITY REPRESENTED	12. SPEC. & AMEND AND/OR DRAWING NO. & REV FOR SAMPLE & DATE DL-5-2457	
13 PURCHASED FROM OR SOURCE		14 SHIPMENT METHOD	15 DATE SAMPLED AND SUBMITTED BY D.K. [Signature]	

16 REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS.  
 1st Cycle

17 SEND REPORT OF TEST TO  
 TEST CYCLE DIVISION X4507

SECTION B - RESULTS OF TEST (Continue on plain white paper if more space is required)

1 DATE SAMPLE RECEIVED	2 DATE RESULTS REPORTED	3. LAB REPORT NUMBER 81-0669		
4 TEST PERFORMED	RESULTS OF TEST	SAMPLE RESULT	REQUIREMENTS	

DATE	TYPED NAME AND TITLE OF PERSON CONDUCTING TEST	SIGNATURE
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REQUEST FOR AND RESULTS OF TESTS				PAGE NO	NO OF PAGES
<b>SECTION A - REQUEST FOR TEST</b>					
1 TO: (Include ZIP Code)  ENGINE DIVISION SPECTROGRAPHIC BRANCH			2 FROM: (Include ZIP Code)  D/MAINTENANCE ENGINE DIVISION ENGINE ASSEMBLY BRANCH		
3 CONTRACTOR AND ADDRESS (Include ZIP Code) 1. AFTER START 2. AFTER 1ST SHUTDOWN 3. AFTER 1ST NRP 4. AFTER 2ND NRP CONTRACT NUMBER ENGINE TEST CELL# 4			4 MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code)  ENGINE TEST CELL# 4		
5. AFTER TRANSIENT CK. 6. AFTER 75% 7. AFTER LAST SHUTDOWN		8. REASON FOR SUBMITTAL SPECTROGRAPHIC OIL ANALYSIS CCAD REG 750-1		9. DATE SUBMITTED 1026	
10. QUANTITY SUBMITTED OIL 7- BOTTLES		11. QUANTITY REPRESENTED		12. SPEC & AMEND AND/OR DRAWING NO & REV FOR SAMPLE & DATE PE-5-1957	
13. PURCHASED FROM OR SOURCE ENGINE TEST CELLS		14. SHIPMENT METHOD		15. DATE SAMPLED AND SUBMITTED BY D. RODRIGUEZ 26 JAN 81	
16. REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS.  ENG(NE SERIAL NUMBER: <del>XXXX</del> SPECIAL ENGINE ENGINE SEQUENCE : K-117  <div style="text-align: center; font-size: 2em; font-family: cursive;">Cycle #13</div>					
17. SEND REPORT OF TEST TO TEST CONTROL SECTION 5CC2F STOP # 25 TEST CELL OFFICE X-4587 OR 2313					
<b>SECTION B - RESULTS OF TEST</b> (Write on plain white paper if more space is required)					
1. DATE SAMPLE RECEIVED		2. DATE RESULTS REPORTED		3. LAB REPORT NUMBER 81 - 085	
4. TEST PERFORMED SPECTROGRAPHIC OIL ANALYSIS		RESULTS OF TEST NORMAL		REQUIREMENTS	
DATE JAN 26, 1982		TYPED NAME AND TITLE OF PERSON CONDUCTING TEST Stephen Toato, Chemist		SIGNATURE <i>Stephen Toato</i>	

DD FORM 1222

REPLACES DD FORM 1222, 1 JUL 58, WHICH IS OBSOLETE.

REQUEST FOR AND RESULTS OF TESTS

PAGE NO. NO. OF PAGES

SECTION A - REQUEST FOR TEST

1 TO: (Include ZIP Code)		2 FROM: (Include ZIP Code)		
3 MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code)		4 MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code)		
5 PRE-START		6 AFTER TRANSIENT		
7 AFTER 1ST RUN		8 AFTER 100		
9 AFTER 2ND RUN		10 AFTER TEST		
11 CONTRACT NUMBER		12 P.O. NUMBER		
13 MATERIAL TO BE TESTED		14 SAMPLE NUMBER	15 LOT NO.	16 REASON FOR SUBMITTAL
17 PURCHASED FROM OR SOURCE		18 QUANTITY SUBMITTED	19 QUANTITY REPRESENTED	20 DATE SUBMITTED
21 SHIPMENT METHOD		22 SPEC. & AMEND AND/OR DRAWING NO. & REV. FOR SAMPLE & DATE		23 DATE SAMPLED AND SUBMITTED BY

REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS

Engine test cell

Engine sequence:

Sample # 20

24 SEND REPORT OF TEST TO

TEST CONTROL SECTION SU 25 Shop 25 Test Cell Office 14587

SECTION B - RESULTS OF TEST (Complete on plain white paper if more space is required)

1 DATE SAMPLE RECEIVED	2 DATE RESULTS REPORTED	3 LAB REPORT NUMBER	
4 TEST PERFORMED	5 RESULTS OF TEST	6 SAMPLE RESULT	7 REQUIREMENTS
SPECTROMETRY	FINAL	NORMAL	

8 DATE	9 TYPED NAME AND TITLE OF PERSON CONDUCTING TEST	10 SIGNATURE
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REQUEST FOR AND RESULTS OF TESTS				PAGE NO	NO OF PAGES
<b>SECTION A - REQUEST FOR TEST</b>					
1. TO: (Include ZIP Code) <b>LABORATORY DIVISION MILITARY BRANCH</b>			2. FROM: (Include ZIP Code) <b>ENGINE Supply Branch ASSEMBLY SECTION</b>		
3. CONTRACTOR AND ADDRESS (Include ZIP Code) <b>PCN-244605</b>			4. MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code) <b>C.C.A.D</b>		
5. CONTRACT NUMBER		6. P.O. NUMBER			
7. END ITEM AND/OR PROJECT <b>T53 ENGINE</b>		8. SAMPLE NUMBER <b>---</b>	9. LOT NO		10. REASON FOR SUBMITTAL <b>FOAM TEST</b>
11. MATERIAL TO BE TESTED <b>OIL</b>	12. QUANTITY SUBMITTED <b>1-QT</b>	13. QUANTITY REPRESENTED <b>---</b>	14. SPEC. & AMEND AND/OR DRAWING NO. & REV FOR SAMPLE & DATE <b>PE-5-L957</b>		
15. PURCHASED FROM OR SOURCE <b>ENGINE TEST CELL #4</b>		16. SHIPMENT METHOD <b>---</b>		17. DATE SAMPLED AND SUBMITTED BY <b>29 JAN 81 D Rodriguez</b>	
18. REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS. <p style="text-align: center; font-size: 1.2em;"><b>Perform Foam TEST on Sample Provided. 75 hours</b></p>					
19. SEND REPORT OF TEST TO <b>ENG-PCN C.A.L. 5007E <sup>STEP #25</sup> TEST CELL OFFICE <sup>X-4557</sup> 2312</b>					
<b>SECTION B - RESULTS OF TEST</b> (Complete on plain white paper if more space is required)					
1. DATE SAMPLE RECEIVED <b>20 Jan 81</b>		2. DATE RESULTS REPORTED		3. LAB REPORT NUMBER <b>81C0075</b>	
4. TEST PERFORMED <b>Foaming characteristics of Mil-L-23699C Lubricating Oil ASTM D 892-72</b>		RESULTS OF TEST		SAMPLE RESULT	
				REQUIREMENTS	
		(Foaming Tendency)		(Foam stability)	
Test Results		Foam value in ml, at end of 5 min blowing period		Foam value in ml, at the end of 10 min settling period	
		Maximum - 5 min.			
Sequence I		5 ml		25 ml	
Sequence II		8 ml		25 ml	
Sequence III		5 ml		25 ml	
				0 ml	
				0 ml	
				0 ml	
DATE <b>13 Feb 81</b>		TYPED NAME AND TITLE OF PERSON CONDUCTING TEST <b>John B. Bullington, Chemist</b>		SIGNATURE <b>E. Charles Wilson, C/Chem Br</b>	

REQUEST FOR AND RESULTS OF TESTS

SECTION A - REQUEST FOR TEST

1 TO: (Include ZIP Code)		2 FROM: (Include ZIP Code)		
LABORATORY DIVISION CHEMICAL BRANCH		D/MAINTENANCE ENGINE DIVISION ENGINE SUPPLY BR		
3 CONTRACTOR AND ADDRESS (Include ZIP Code)		4 MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code)		
		TEST CELL #4		
5 CONTRACT NUMBER		6 P.O. NUMBER		
7 END ITEM AND/OR PROJECT		8 SAMPLE NUMBER	9 LOT NO	10 REASON FOR SUBMITTAL
T53-Engine PCN Z94QC5				Foam Test
11 MATERIAL TO BE TESTED	12 QTY QUANTITY SUBMITTED	13 QUANTITY REPRESENTED	14 SPEC. & AMEND AND/OR DRAWING NO & REV FOR SAMPLE & DATE	
Oil	1 Qt			
15 PURCHASED FROM OR SOURCE		16 SHIPMENT METHOD	17 DATE SAMPLED AND SUBMITTED BY	
C.C.A.C. ENGINE TEST CELLS			29 Jan 81 D. Rodriguez	

18 REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS.

Engine S/N - N/A - Special Engine  
 Engine SEQ - K117  
 (End of 150 Hour Test)

19 SEND REPORT OF TEST TO

Test Control Section 5CC2E Stop #25 Test Cell Office X2313 X4587

SECTION B - RESULTS OF TEST (Continue on plain white paper if more space is required)

1 DATE SAMPLE RECEIVED	2 DATE RESULTS REPORTED	3 LAB REPORT NUMBER	
30 Jan 81		81C0080	
4 TEST PERFORMED	RESULTS OF TEST	SAMPLE RESULT	REQUIREMENTS
Foaming characteristics of Mil-L-23699C Lubricating Oil ASTM D892-72			
Test Results	(Foaming Tendency)	(Foam stability)	
	Foam value in ml, at end of 5 min. blowing period	Foam value in ml, at the end of 10 min. settling period	
	Maximum - 5 min.		
Sequence I	2 ml	25 ml	0 ml
Sequence II	10 ml	25 ml	0 ml
Sequence III	3 ml	25 ml	0 ml

DATE	TYPED NAME AND TITLE OF PERSON CONDUCTING TEST	SIGNATURE
13 Feb 81	John B. Bullington, Chemist	E. Charles Wilson, C/Chem Br

DD FORM 1222

REPLACES DD FORM 1222, 1 JUL 58, WHICH IS OBSOLETE.

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END

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