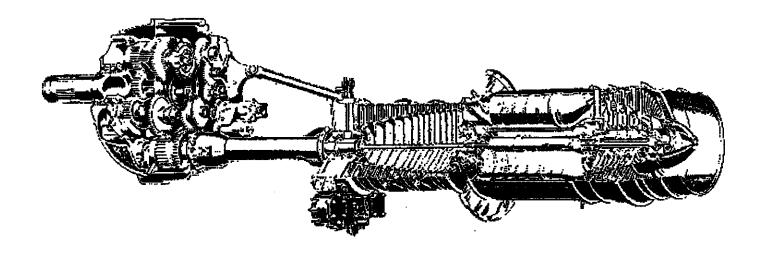


# **Accident investigation**

On-site engine Investigation report

Rolls-Royce Corporation Model T56-A-9D Engines AE100843, AE101504, AE101267, A100814



Hawkins & Powers Walker, California

Michael A. Weber

Michael A. Weber Senior Air Safety Investigator

Accident date: June 17, 2002

Investigation date: June 18-20, 2002

Report date: July 26, 2002

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#### 1. SYNOPSIS

On June 17, 2002, about 15:00 hours local time, a Lockheed C130A aircraft, N130HP, operated by Hawkins & Powers, experienced an in flight structural break up and was destroyed in a post crash fire. The mishap occurred near Walker, California. The three crew members received fatal injuries. The NTSB-SWR office was charged with conducting the investigation. The NTSB IIC requested assistance from the airframe and engine manufacturers for the investigation. Rolls-Royce and Lockheed Martin complied with the request. This report presents the facts and findings of the aircraft and engine examinations conducted on-site at Walker, California on June 19-21, 2002.

#### 2. FACTUAL INFORMATION

## 2.1 History of Flight

The C130A Aircraft had departed Minden, Nevada, at an undetermined time, to participate in fire fighting efforts near Walker, California. A Company flight plan had been filed and visual meteorological conditions prevailed. The U.S. Forestry Service was operating the aircraft for the public use fire fighting flight under 14 CFR Part 91. The aircraft had just made a pass over a fire and dropped a load of fire retardant when the incident occurred. The aircraft was registered to Hawkins and Powers Aviation, Inc., Greybull, Wyoming.

#### 2.2 Personnel Information

The three crewmembers were Steve Wass, Greg Labaire, and Mike Davis. No additional information was provided

#### 2.3 Injuries to Persons

Injuries to all three crewmembers were fatal.

#### 2.4 Aircraft Information

Model	Lockheed C130A
Serial Number	3146
Registration Number	N130HP
Airframe Total Time	21863.0
Last "A" check Inspection	21863.0
Last "B" check Inspection	21695.5
Last "C" check inspection	21401.5

Engine Model Allison T56-A-9D

Rating: 3750 Shaft Horsepower

Engine Position Number 1 AE100843
Engine Total Hours 10100.4
Last "A" check Inspection 10100.4
Last "B" check inspection 1580.2
Last "C" check inspection 1253.5

Engine Model Allison T56-A-9D

Rating: 3750 Shaft Horsepower

Engine Position Number 2 AE101504
Engine Total Hours 9943.5
Last "A" check Inspection 9893.1
Last "C" check inspection 9598.7

Engine Model Allison T56-A-9D

Rating: 3750 Shaft Horsepower

Engine Position Number 3 AE101267
Engine Total Hours 10875.1
Last "A" check Inspection 10875.1
Last "B" check inspection 10679.9
Last "C" check inspection 10385.5

Engine Model Allison T56-A-9D

Rating: 3750 Shaft Horsepower

Engine Position Number 4 A100814

Engine Total Hours Unknown/TSO 2612.5

Last "A" check Inspection 2612.5
Last "B" check inspection N/A
Last "C" check inspection N/A

#### 2.5 Meteorological Conditions

As reported by the NTSB IIC:

Visibility = 10 miles

Clouds = Few scattered

Altimeter = 30.21

Temperature = 23° C

Dew Point = 1° C

Winds = Southwest to Northwest at 6 knots gusting to 10 knots

#### 2.6 Aids to Navigation

There were no known aids to navigation. The flight was operating under visual flight rules (VFR) conditions and the pilot was said to be familiar with the area.

#### 2.7 Communications

None

#### 2.8 Aerodrome Information

None

## 2.9 Flight Recorder

The aircraft was not equipped with either a Cockpit Voice Recorder or a Flight Data Recorder.

#### 2.10 Wreckage and Impact Information

#### **General Wreckage Site Observations:**

The entire most southerly impact area exhibited fire/heat damage to all of the aircraft, engine, and propeller parts/components as well as scorched earth. No fire damage was observed in the most northerly impact area. The area and the aircraft parts around the initial aircraft impact area were covered with fire retardant. No large pieces of the fuselage or cockpit area were recovered except for a section of cargo flooring identified to have been located just aft of the cockpit. Several items were found either on highway 395 or in the brush located west of highway 395, which were not part of the main impact site. A piece of the top of the center wing measuring 276.5-inches long x 44-inches wide (maximum of six stringers) was found on highway 395.

From the seam lines this piece was comprised of 2½ panels with one complete panel. Four panels make up a complete configuration width. A single center wing stringer plus a piece of the upper center wing, measuring 93-inches long x 12.5 inches wide with a lap joint visual, was found in the brush on the west side of highway 395. A wreckage diagram is included as an appendix to this report.

### Visual Observations of Individual Components were as noted:

#### Right wing outer flap and flap track:

The jackscrew was still attached to flap and the jackscrew nut was visible and appeared to be at the 50% position (mid length of the jackscrew). Another jackscrew was found separate from the flap structure but still in this area. The jackscrew nut on this jackscrew was also at the 50% position.

## Left outer wing:

The left outer wing was found with a broken outboard rainbow fitting. The wing was found top facing up and the entire wing was consumed by fire.

## Bottom of the center wing with the exception of the right outboard 10-inches:

The center wing within the fuselage measured about 110-inches radially (lengthwise) and the entire length should have been 122-inches long. The center wing was found with the bottom facing up and the left inboard engine (No. 2) engine pylon was still attached. The left center wing leading edge was still attached and exhibited heat damage, melting, blistering of the paint and fire consumption of some of the material. Fire damage and blistering of the paint was observed on the inside of the bottom on the center wing section. The most intense fire damage on the inside of the bottom of the center wing section was noted to be in the vicinity of the cross feed manifold. A section of the outer left wing measuring 39-inches long was still attached to the center wing.

From the seam lines this piece was comprised of 2½ panels with one complete panel. Four panels make up a complete configuration width. A single center wing stringer plus a piece of the upper center wing, measuring 93-inches long x 12.5 inches wide with a lap joint visual, was found in the brush on the west side of highway 395.

Note: A wreckage diagram is included as an appendix to this report.

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Two pieces of the top of the center wing were recovered. One piece measured 150-inches long x 79-inches wide (80 inches wide in the entire panel width) with a total of 11 stringers. On this piece a 30-inch section of the outer wing was still attached. The other piece of top of the center wing that was recovered measured 130-inches long x 38-inches wide with a total of 5 stringers.

#### Right outer wing with rainbow fitting and No. 4 engine nacelle area:

The wing bolts were still secure. The wing was found bottom facing up. The wing exhibited extensive fire damage witch included melting of the skin and the fire consumed some areas. The flap plus flap track was found in the area and was separated from the wing.

## The empennage / tail section:

The empennage / tail section was found separated from the rest of the aircraft and was lying on its right side. The empennage / tail section was separated in line with the upper escape hatch attachment. The cargo door and the ramp were both found detached from the aircraft structure. The right horizontal stabilizer was fractured at the root of the vertical stabilizer. The left horizontal stabilizer was intact, with the counterweight still attached, and outer tip exhibited impact damage. The entire left horizontal stabilizer tip was bent downwards, the leading edge of the tip was bent aft, and the skin was compressed. The elevator and rudder boost packs were still attached to empennage. The vertical tail was intact but exhibited impact damage. A hole was observed on the right side middle manual of the rudder. This hole did not pass though to the left side. The lower rudder surface near the horizontal stabilizers was pushed forward and deformed.

## 2.11 Engine Examination

#### Engine No. 1

As numbered left to right aft looking forward, SN AE100843, PN 6846583. The last overhaul according to the data plate took place on June 12, 1984 at 8,342 hours on the engine. The torque meter was intact but separated from the inlet housing. A section of the reduction gearbox housing and the drive gears were still attached to the torque meter. The accessory and reduction gearbox housings were fractured and the gears were exposed. The compressor and turbine cases exhibited no breaches. All of the 1<sup>st</sup> stage compressor blades were intact and none exhibited any bending. The engine was still attached to the pylon and the pylon exhibited fire damage and blistering of the paint. The engine was covered in soot forward of the heat shield.

## Engine No. 2

SN AE101504, PN 6897151 as identified by the data plate. The last overhaul according to the data plate took place on October 23, 1978 at 1,229 hours on the engine. The engine was still attached to the pylon. Examination of the 1<sup>st</sup> stage compressor blades and the 4<sup>th</sup> stage turbine blades revealed that all the blades were intact and that the blade tips were slightly bent in the direction opposite rotation. The accessory gearbox remained still attached to the engine however; the left side of the accessory gearbox was fractured exposing the accessory gears. The reduction gearbox was fractured exposing the reduction gears. Fire/heat distress was observed forward of the heat shield but none aft of the heat shield. The torquemeter assembly was not attached to the inlet housing.

## Engine No. 3

SN AE101267, PN 6897151 as identified by the data plate. The last overhaul according to the data plate took place on May 5, 1984 at 8,454 hours on the engine. The torquemeter was intact but separated from the inlet housing. A portion of the reduction gearbox and drive gear was still attached to the torque meter. The reduction gearbox housing was fractured and the gears were separated from the pinion gear. The compressor and turbine cases exhibited no breaches and the engine remained attached to the pylon. All of the 1<sup>st</sup> stage compressor blades were intact and some were bent in the direction opposite rotation (the engine rotates counterclockwise from the rear). The remaining 1<sup>st</sup> stage blades were normal. No signs of fire damage were observed on the engine. Heavy sooting and fire damage was noted on the inlet housing assembly.

#### Engine No. 4

SN A101267, PN 6897151 as identified by the maintenance records. The 1<sup>st</sup> and 2<sup>nd</sup> stage compressor blades were heavily bent in the direction opposite rotation to the point that the blades were laying one on top of the other. The inlet housing, accessory gearbox, and reduction gearbox were all consumed in the post-crash fire. Examination of the 4<sup>th</sup> stage turbine blades revealed that they were bent over in the direction opposite rotation. The engine was still attached to the pylon and no fire damage was observed aft of the heat shield. The compressor and turbine cases exhibited no breaches.

#### **PROPELLERS**

All sixteen-propeller blades were accounted for with six of the blades still attached to the propeller hub and the remaining blades scattered in and around the general area where the wings, propeller assemblies, and engines were found. All of the propeller blades found separated from the propeller assembly exhibited varying degrees of damage which included tip fractures, multiple airfoil fractures, blade butt fractures, airfoil impact marks, airfoil scrape marks, bent airfoils, and twisted airfoils. All the blades were found imbedded into the soil and some exhibited fire damage to the deicing boot and/or were covered with soot. Three of the propeller blades found separated from the propeller assemblies had numbers on the airfoil. Those numbers were N231, N239471, and N239471.

All four-propeller assemblies were accounted for and were found in and around the general area where the wings and engines were found but were all separated from their respective engine.

# 2.12 Engine Maintenance and Records.

# **Engine Position #1**

Component	Serial Number	Part Number	Total Time	TSO
Engine	AE 100843	6846583	10100.4	1757.1
Gearbox	Unknown	Unknown	Unknown	Unknown
Power Section	Unknown	Unknown	Unknown	Unknown
Torquemeter	Unknown	Unknown	Unknown	Unknown
Fuel Control	Unknown	Unknown	Unknown	Unknown
Temp Datum Valve	Unknown	Unknown	Unknown	Unknown
Coordinator	Unknown	Unknown	Unknown	Unknown
Fuel Pump	Unknown	Unknown	Unknown	Unknown
Speed Control	Unknown	Unknown	Unknown	Unknown
Speed Valve	Unknown	Unknown	Unknown	Unknown
Torquemeter Pickup	Unknown	Unknown	Unknown	Unknown

# **Engine Position #2**

Component	Serial Number	Part Number	Total Time	TSO
Engine	AE 101504	6897151	9943.5	3802.5
Gearbox	Unknown	Unknown	Unknown	Unknown
Power Section	Unknown	Unknown	Unknown	Unknown
Torquemeter	Unknown	Unknown	Unknown	Unknown
Fuel Control	Unknown	Unknown	Unknown	Unknown
Temp Datum Valve	Unknown	Unknown U	Unknown	Unknown
Coordinator	Coordinator Unknown Unknown	Unknown	Unknown	Unknown
Fuel Pump	Unknown	Unknown	Unknown	Unknown
Speed Control	Unknown	Unknown	Unknown	Unknown
Speed Valve	Unknown	Unknown	Unknown	Unknown
Torquemeter Pickup	Unknown	Unknown	Unknown	Unknown

# **Engine Position #3**

Component	Serial Number	Part Number	Total Time	TSO
Engine	AE 101267	6897151	10875.0	2420.0
Gearbox	Unknown	Unknown	Unknown	Unknown
Power Section	Unknown	Unknown	Unknown	Unknown
Torquemeter	Unknown	Unknown	Unknown	Unknown
Fuel Control	Unknown	Unknown	Unknown	Unknown
Temp Datum Valve	Unknown	Unknown	Unknown	Unknown
Coordinator	Unknown	Unknown	Unknown	Unknown
Fuel Pump	Unknown	Unknown	Unknown	Unknown
Speed Control	Unknown	Unknown	Unknown	Unknown
Speed Valve	Unknown	Unknown	Unknown	Unknown
Torquemeter Pickup	Unknown	Unknown	Unknown	Unknown

# **Engine Position #4**

Component	Serial Number	Part Number	Total Time	TSO
Engine	AE 100814	Unknown	Unknown	2612.9
Gearbox	Unknown	Unknown	Unknown	Unknown
Power Section	Unknown	Unknown	Unknown	Unknown
Torquemeter	Unknown	Unknown	Unknown	Unknown
Fuel Control	Unknown	Unknown	Unknown	Unknown
Temp Datum Valve	Valve Unknown Unknown	Unknown	Unknown	Unknown
Coordinator	Unknown	Unknown	Unknown	Unknown
Fuel Pump	Unknown	Unknown	Unknown	Unknown
Speed Control	Unknown	Unknown	Unknown	Unknown
Speed Valve	Unknown	Unknown	Unknown	Unknown
Torquemeter Pickup	Unknown	Unknown	Unknown	Unknown

Note: Individual component times and history were not documented. The above times were provided to the author from the owner.

## 2.13 Additional Information

Focus of the investigation was pointed toward aircraft structural issues based on this aircraft models' previous history. It was the decision of the NTSB IIC and the investigation team that investigation of the engines would be limited to visual on-site observations only.

#### 3. FINDINGS & CONCLUSIONS.

- Visual examination on-site of all four engines did not reveal any evidence of any pre-impact mechanical failures. All damages to the engines were the result of impact forces caused by the crash and the post crash fire.
- All four engines were operating at the time of impact with terrain. Evidence of engine operation
  at the time of impact was blade bending in the opposite direction of engine rotation noted on the
  compressor and turbine sections as well as missing gear teeth on accessory gears.

Appendix A.

**On-Site** 

**Photographs** 

At

Walker, California



Photo #1 – Engine wreckage field

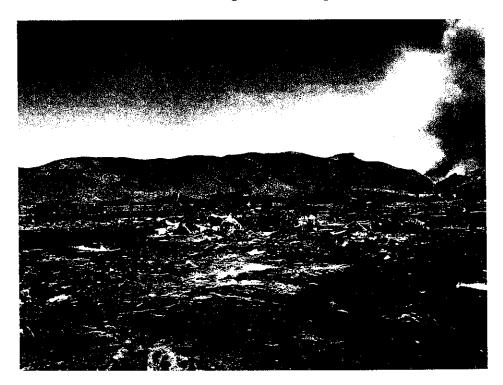


Photo #2 – Engine wreckage field



Photo #3 – Aircraft wreckage field

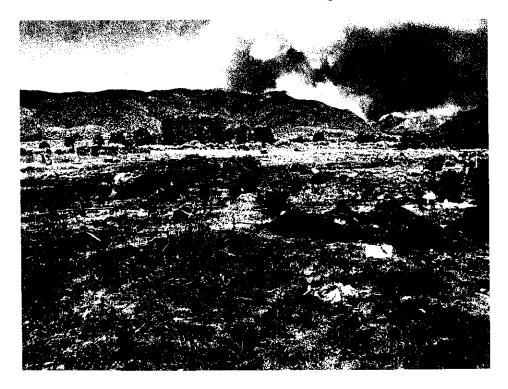


Photo #4 – Aircraft wreckage field

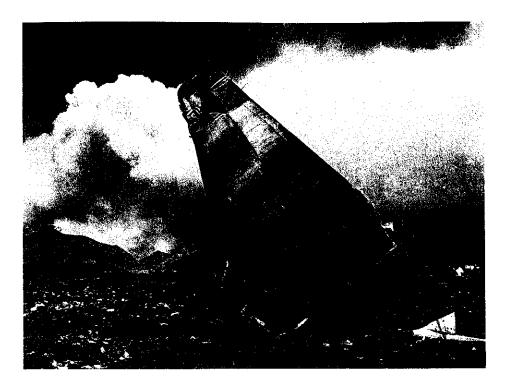


Photo #5 - Aircraft parts



Photo #6 – Aircraft debris



Photo #7 - Flight path

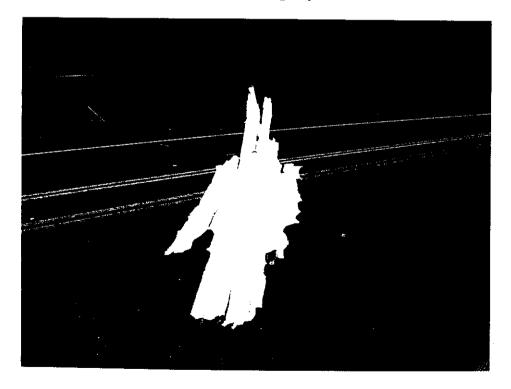


Photo #8 - Debris on road



Photo #9 – Aircraft wing



Photo #10 - Prop and gearbox assembly



Photo #11 – Engine inlet



Photo #12 - Engine inlet

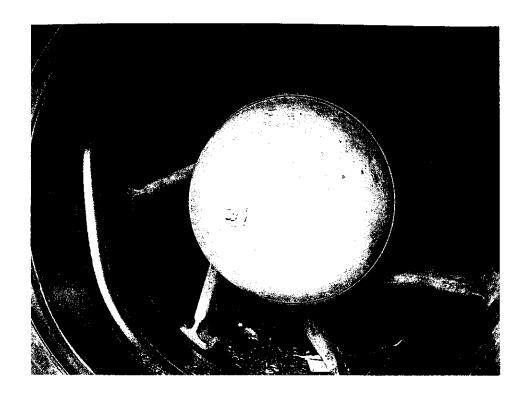


Photo #13 – Engine rear turbine area

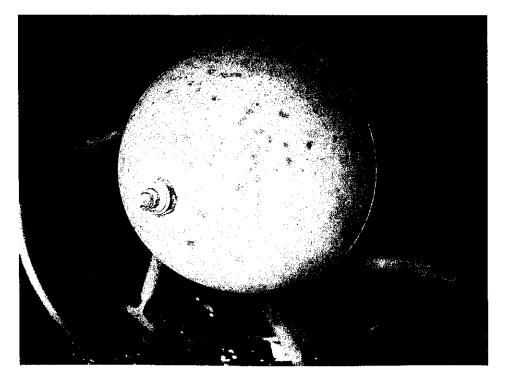


Photo #14 – Engine rear turbine area

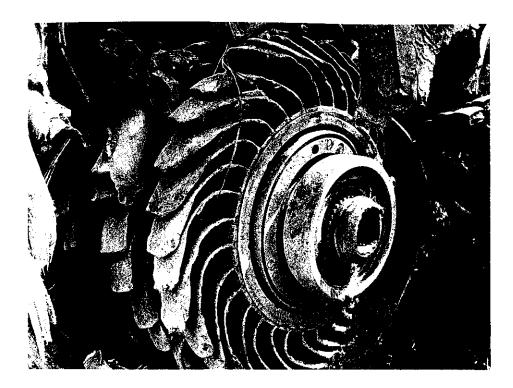


Photo #15 - Engine compressor



Photo #16 – Engine compressor

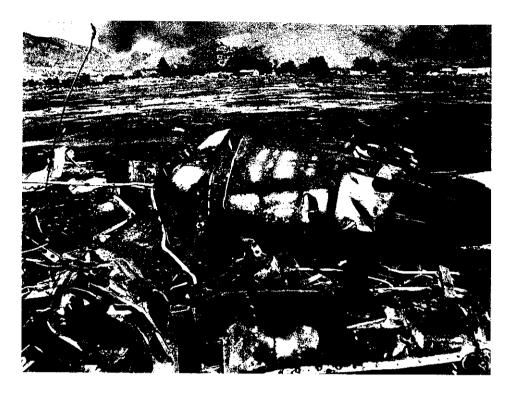


Photo #17 - Engine debris



Photo #18 – Engine debris



Photo #19 -- Engine debris



Photo #20 - Engine debris



Photo #21 - Engine debris



Photo #22 - Engine debris



Photo #23 – Prop and gearbox assembly

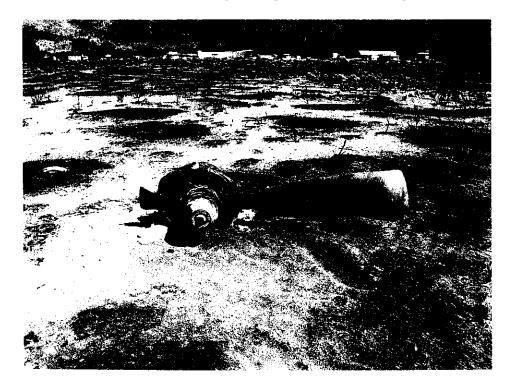


Photo #24 – Prop and gearbox assembly

Appendix B.

Engine #1

Logbook

T-130 #1 T56A-9D S/N AE100843



ASA-SE-1

Engine Record General Informati		
Manufacturer #// Eou	180843 Type Certificate	
Serial AF 8400	180843Type Certificate	
This engine is currently installed in a		
Minimum Octane Fuel	Oil Grade: Summer Winter	
Magneto Time	Point Setting Firing Order	
Spark Plug Gap		
Manufacturer recommended overhau	ul at hours	

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The Standard Engine Log SE-1

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Printed in Canada





1994	RECORDING TACH TIME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	Description of Inspections, Tests, Repairs and Alterations Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair Facility. (See back pages for other specific entries.)
4/20			545,4	1 certify this END has been inspected in ac
7				1 certify this CNO has been inspection.  2 certify this CNO has been inspection.
				cordance with the procedures of ar FAC (1) and Inspection Program per FAR ST AIR (1) (4) and Condition.
				Inspection Program per FAR STAR Condition.  was determined to be in airworthy condition.  Total Time Date Transport
				Total Time The Date
				HAWKING & FOWERS AVIATION INC.  PAA CRS BZBR701C
				GREYBULL. WYOMING
4/20/9	14	IN	STAUS	Ehr # 1 parition T-130 TAT200829
// /				
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DATE 19 <i>4</i> 5	HECORDING TACH TIME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	Description of Inspections, Tests, Repairs and Alterations Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair Facility. (See back pages for other specific entries.)
11 5	<u>А</u> РН 1995		788.0°	cordance with the procedures of an FAA Approved Inspection Program per FAR 91.409 (1) (4), and was determined to be in airworthy condition.  Total Time Signed Date 11 5 APR 1995 HAWKINS & POWERS AVIATION, INC. FAA CRS GREYBULL, WYOMING

RECORDING TACH TIME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	Description of Inspections, Tests, Repairs and Alterations Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair Facility. (See back pages for other specific entries.)
1996			1 certify this ENE has been inspected in ac TAT 20417.05 cordance with the procedures of an FAA Approved WO 96-0035 Inspection Program per FAR 91.409 (f) (4), and was determined to be in airworthy condition.  Total Time:  Signed Date 21 JUN 1996  HAWKINS & POWERS AWATION, INC.  FAA CRS BZBR701C  GREYBULL, WYOMING
			Removed + Replace turbin assy 7AW  TO 25-T56-16 Lenk Cluck Good,  Performe seal Break-in TAT 20417.05  TSO FNG 879,5 Stuinstalled 0428  ef wo # 96-03 Here The
	TACH TIME	TACH FLIGHT TIME	TACH TIME FLIGHT TIME IN SERVICE

19	RECORDING TACH TIME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	. Description of Inspections, Tests, Repairs and Alterations  Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair  Facility. (See back pages for other specific entries.)
MAR 2	4 1997		94465	Third time and time and does of last constant  TT: 9446.5  varified from military records on file at Heading and Powers Aviation, Inc.  TSO: 1104.90
				FAA CITE TO: 1/04.90
			5	coordinate with the procedures of an FAA Approved  TSO: 1104, 96
MAR 2 4	1997		94465	cordance with the procedures of an FAA Approved  Inspection Program per FAR 91.409 (f) (4), and  TSO: 110 4, 96  Was determined to be in airworthy condition.  +AT: 20642 45
				Total Tipg: 9446.5
<del></del>		! 		HAWKINS & POWERS AVIATION, INC.
				GREYBULL, WYOMING

OASA 1993

19	RECORDING TACH TIME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	<b>Description of Inspections, Tests, Repairs and Alterations</b> Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair Facility. (See back pages for other specific entries.)
<u>5/10/97</u>	1/26.9		Programme gandenical	This QEC has been modified for the installation of HP-C-130AChip Detector Circuit per 337 for the following aircraft: T-131-337 dated 6/6/97, T-130-337 dated 5/10/97, T-133-337 dated 5/21/97.
				of Was

_				750	$\dot{\kappa}$
DA 19	TE	RECORDING TACH TIME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	Description of Inspections, Tests, Repairs and Alterations Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair Facility. (See back pages for other specific entries.)
APR	APR 15	1999		1253.31	l certify this Engine has been inspected in accordance with a Cinspection
					and was determined to be in airworthy condition.
					Signature Certificate No. Date 15 1939/C/Lag. Total Time 20890.
					HAMKING & POWERS AVIATION INC.
_					FAA CRS Work Order No. 6107C
					Greybull, Wyoming
AUG	3 (	1999		148271	REMOVED ENG T-130=1 POSITION METAL ON R.G.B MAG PLUG-ENG TSD:
<del></del> -,		*			METAL ON R.G.B MAG PLUG-ENG TSO:
					1482.77 ENGTT 9824.37 TAT.21021.92
			د		1482.77 ENGTT 9824.37 TAT.21021.92
				-	
					©ASA 1993

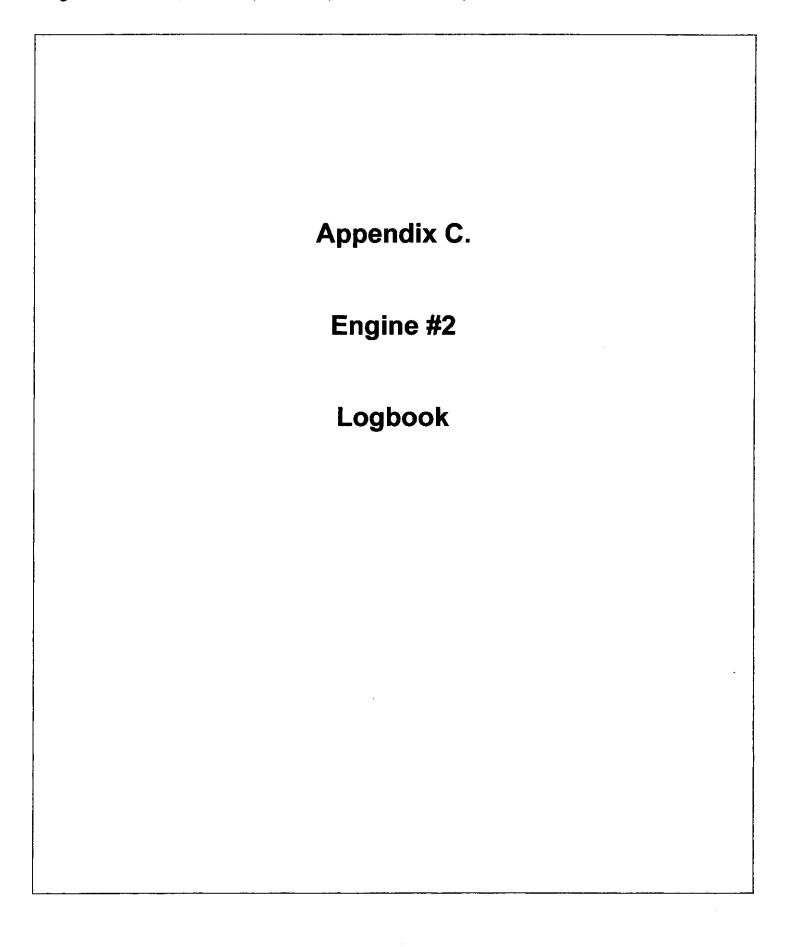
19	Ţ	ECORDING ACH IME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	Description of Inspections, Tests, Repairs and Alterations Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair Facility. (See back pages for other specific entries.)	
EP 1	7	1999	14		Keplaceo Boller Bearing on	
		F:	୍ ଓଷ୍ଟ		MAIN Drive GEAR 1.A.W 25-TSG-1	
	1	£183()1/1/	144	aren di	REF WOH 7534. HAWKING Pares	
				£3.41.	film of	
OCT	2 5	1999	14	82.77	OP'S CHELKED ENGINE I.A.U IC-130A-2-4	
					16-1388-2-11, C/w compressor WASH, INUSP	
					ELTED R.G. B 3 POWER SELTION MAG PLUS	
					3 OIL SCREENS C/W PERFORMANCE ROW, OPS	
				•	3 LEAK CK Good ENG performants 10040	
					REF WO # 7660 HAWKING 3' POWERS	
					the second	
ASA 1993						

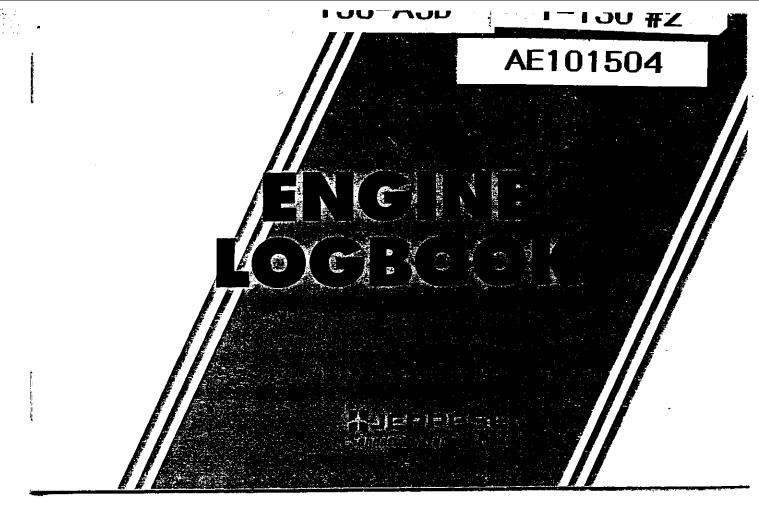
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DATE 19	RECORDING TACH TIME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	Description of Inspections, Tests, Repairs and Atterations Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair Facility. (See back pages for other specific entries.)	
AUG 1	2 2001			TALLED# 1 POSITION T- 130 TAT 2/5983  GNGING TT 9825. 97 I.A.W 1C-1504-2- REF NOT PEBOOC - HAUKING 3 FORM	
				ENGINE TT 9825.97 I.A.W 16-1804-2-	
				ROT NOT BESONCY HAUXING 3 POWER	
4 500	, <b>.</b>		^		
SEP 1	2001	1580.9	1	I certify this ENGINE has been inspected	
<del></del>				in accordance with a Bokek inspection	
		<del> </del>		and was determined to be in airworthy condition.	
		.		Signature Certificate No.	
	2	·		Da&FP 1/201 A/C/Es. Total Time 2 1695.62	
				HAWKINS & POWERS AVIATION, INC.	
				FAA CRS Work Order No. 133//	
				Greybull, Wyoming	

DATE 19	RECORDING TACH TIME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	Description of Inspections, Tests, Repairs and Alterations Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair Facility. (See back pages for other specific entries.)
AUG 1	1 2001	2248.49		A Ck CW TATIZISTE WORLZ THE
AUG 3	0 2001	1530.09		A Ck CW TATA/45 WO#/30334
SEP 2	0 2001	1554		A Ck CW TAT2/672 WO#/3230
NOV	1 2 2001	1590,57		A CK CW TAT: 2706-4NO# 13376
MAR	2 9 20 <b>02</b>	1632.38		A Ck CW TAT: 2174791 WO# 14439
APR 2	1 2002	1649.09		A Ck C/W TAT:2176/34WO#145 44
MAY 1	2 2002	167551		A Ck CW TAT2/79/. WO#/4886
JUN 2	- 2002	10324		A Ck C/W TAT 2/8/2? WO#/5///
				© ASA 1993

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EA-ELB

# **ENGINE LOGBOOK**

Logbook	No	1		
From	FFR		1998	
To	1 20			

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# **ENGINE DESCRIPTION**

MANUFACTURER ALL	NOSI	MODEL	<b>756</b>	
			3 FEB, 1978	
RATED BHP/SHP/THRUST	RPM	13820	MANFOLD PRESSURE	110 99 5
			E FUEL	
RECEISTERED OWNER	twicing 3 Po	wers Au	14-T/ON	
STREET & NO. 244	1 HIGHWAY	14		
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STREET & NO.			······································	
CITY, STATE, ZIP				
			····	
TBO HOURS		LAST OVERHAUL DATE	HOURS 14 MAY 197	19
				3

## INSTALLATION

				111017		<u> </u>			
-			INSTALLED			REMOVED			
-	DATE	TYPE	SERIAL NO.	LOCATION	TOTAL TIME	DATE	TOTAL TIME	AGENCY AND CERTIFICATE NO.	
FF	R 12 1998	C-130A	ナルりし	#Z POSTIN	19235	8AU&98	19276.29	HAWKINS ? Puers	
2	15 1998	C-130A	N8236H	<sup>#</sup> 3	148221	4-14-99	148803	HALVORS PECEL	
	8 A 1000		T-130	#2 9184	200 5	5-27-00	9 <u>2</u> 89. 96	Hawous : Paus Hookins & Yours	
7.	/21/00	C-130A	T-130	#2 6	71,219.33				
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1998 9115.1	This QEC has been me of HP-C-130AChip Do the following aircraft: T-130-337 dated 5/10/	etector Circuit per 33 T-131-337 dated 6/6/97, T-133-337 dated	37 for · 6/97,	
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	19989115-1	verified from as	varified from military recents on the at House and Pavers Artistan, lag.	varified from military records on the at Hernidian and Persons Artistics, Ing.

•	DATE	TOTAL TIME	INSPECTION OR MAINTENANCE PERFORMED  AGENCY & CERTIFICATE NO.
<u> </u>			
FFR	1 2 1009	9115-1	C/W HAWKING & POWERS FAA APPOVED HP-C-130A
_	- 0 000		INSPECTION GUIDE "C CHECK" REPLACED ALL(6)
			FUEL NOZZLES, REAR BEARING SUPPORT, ING
			EXCITER 3 ACGEN INSTALLED ENGINE # 2 POSITION
			T-131 TAT 19235,02 ENG TSO 2974.1 OP'S 3
_			LEAK CHECK GOOD 1.A.W 12-130A-2-4 3 12-13A-2-11
		·	Enging performance 102.2% FOR ADDITIONS
_	•		INFORMATION REF WOX 3909
_			HAWKING & POWEUS
		9176.10	
'AUG	1 1998	9282.91	Replaced Both IGNITORS AND LEADS I.A.W
-			25-156-16 June 1/100
_	_		1AT 19282.97 TSO 3021.96 HAUKINS ? POWER
<del>-</del>	A_A		
AL	8 43%	9176.10	Engine Removed T-131 #2 POSITION TAT 19296.29
i _			FOT CHIPS ON R.G.B MAG PLUG ENS 150 3035
_			REF WOT 5194.
			Hukius i fluits

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		-	1110.	1.A.W 2J-T56-16. R.G.B. TSO 3549.3
-				ENG TSO: 3035,16 OP'S 3 LEAK CK
_				Good 1. A.W 12-130A-2-4 REF WOX 520
_				OLD R.G.8 S/M A 202 BZA HAWKINS 3/DURKS
		•		
IP_	<u>15</u>	1900	9176.10	INSTALLED ENGINE # 3 POSITION
_		úl:	ξ	N 8230H TAT 14872.1 ENG TSO 3035.10
_				I.A.W IC-130A-2-4 REF WO 5155
_				MATA SHAWKING 3 POWERS
_				
R_	14	1999	9184.3	KEMOUED Engine F.O.M TAT
_				14880.3 #3 DOSITION N 8230H
_				REF CHO# 6573. Eng TSO 3043.3.
_				HAWKINS & POWERST.
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	DATE	TOTAL TIME	INSPECTION OR MAINTENANCE PERFORMED AGENCY & CERTIFICATE NO.
AUS	26	13991843	INSTALLED ENG T-130 TAT 2005.14
_			#2 POSITION OP'S LK Checks Good
_			1.A.W 12-136A-2-4 REF WOT 7473C.
_			ENA T.SO. 3043 3 HAWKINS 3 POWERS
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_			21059,67 REB WO# 7778C. HAWKINS ROWANS
_			June 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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_			TSO: 3128.06
			5h al iva
MAY	192	2001 9326.22	A CK CW TATE WOUNT
·			ENS 750 3130,69
MAY	272	000 9344	ENGINE REMOVED T-130 * 2 POSITION TAT 21112.98
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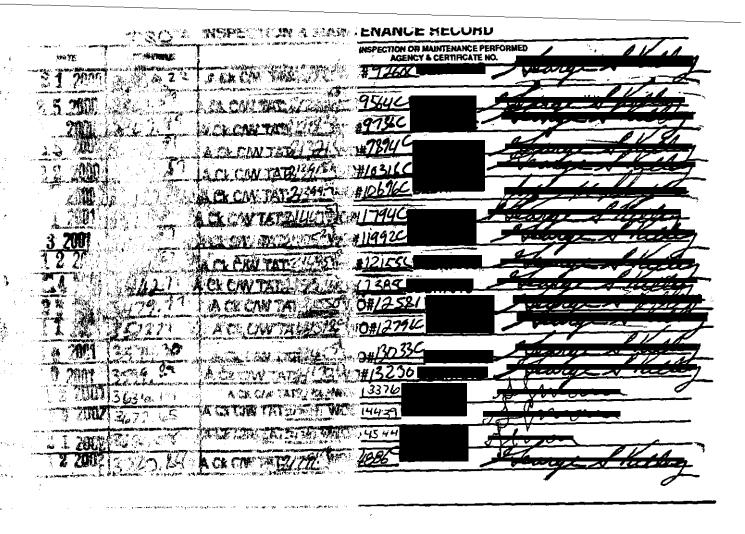
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<u>-</u>			INSPECTION & MAINTENANCE RECORD		
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			ALL FUEL NOZZLES (6EA) 1.A.	w	<u> </u>
			2J-T56-16 3'14 OPS CHECK 6500	IALL	
			1C-130A-2-4 REF WO# 9014N	5NG	<u>-</u>
			TSO 3148,96, HAWKINS 3 HOWEL	5	
			to Ulla State		_
	<u> </u>			, <b>4.8</b>	j.
JUN	28 2000	9289.96	RAN ENGINE ENGINE PERFOR	MANCE	<u>-</u>
•			100.4 LEAK CHECK J'OP'S CK GOO	zel ]. A.	<u>. Lu</u>
			1C-130B-2-11 3' 1C-130A-2-4 C	My To	<u>25</u> )
_		Cartina and the same	3148.96 REF NO# 9074N- HAWKI	NS 3 PC	<u>nien</u>
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_	DATE	TOTAL TIME	INSPECTION OR MAINTENANCE PERFORMED AGENCY & CERTIFICATE NO.
WE	21 200	9289.95	INSTALLED ENGINE #Z POSITION T-130 " THT 21219. 22 GNG TSO 3148 96 IAW 1C-130A-2-4
_			TAT 21219, 22 GNG TSO 3148 46 IAW 10-130A-2-4
_			OP'S 3'LEAKCK Good 1. A.W 15-130A-2-43/6-1308-2-
_			ENG PERFORMANCE 99.7% ROK WO 9541C-
			HAWKINS 3 POWERS
Ju			
<b>46</b>	N 8 20	9382.52	I certify this ELGING has been inspected ENG 150:2641.2
			in accordance with a Wheel inspection
_			and was determined to be in airworthy condition.
_			Cignature Lennicate No.
_			Date 18 200 A/C/Sag. Total Time 2//25.69 HAWKINS & POWERS AVIATION, INC.
_		<u> </u>	HAWKINS & POWERS AVIATION, INC.
-	<del></del>		FAA CRS Work Order No. 9405C
_			Greybull, Wyoming
_		<u> </u>	
_			

				INSPECTION & MAINTENANCE RECORD
	DATE	·	TOTAL TIME	INSPECTION OR MAINTENANCE PERFORMED AGENCY & CERTIFICATE NO.
MAR	182	2001	9598,77	I certify this ENGINE has been inspected 750:3331.08.
_	•			in accordance with a Collect inspection
			•	and was determined to be in airworthy condition.
-				Signature Certificate No.
~				DatMAR X 71811A/C/Ling. Total Time 2790/39
-				HAWKINS & POWERS AVIATION, INC.
•	·			FAA CRS BZBR701C Work Order No. 10407C
-				Greybull, Wyoming
APR	2820	01	9637.95	REPLACED ALL FUEL NOZZEL'S (6) -
				1,A,W 1C-130A-2-4 TAT 21440,52
				ENGTSO: 3370.26 REF WO= 11666C.
_				1 HAWKINS 3 POWERS
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				and was determined to be in airworthy condition.
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				HAWKINS & POWERS AVIATION, INC.
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-		-		Greybull, Wyoming
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MIAK	40	COUL	9830.8	Replaced All 6 Fuell Nozzels 14 W
				TO 1C-130A-Z-4 TAT 21747,91 ENG 750 3677,65
				Ref WO# 13965C HAWKWS ! POWERS
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# ENANCE RECORD REPETION OR MAINTENANCE PERFORMED AGENCY'S GENTHICATE NO. SUMMER AGENCY SUMER AGENCY SUMMER AGENCY SUMER AGENCY SUMMER AGEN

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Appendix D.

Engine #3

Logbook

T56-A9D

AE-101267

#3



n the USA

A 1

**EA-ELB** 

# **ENGINE LOGBOOK**

DEC 84

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(800)443-9250 (307)266-3838 FAX: 307-472-5106

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SECTION SEQUENCE	DESCRIPTION OF SECTION	7	PAGE NUMBER
		· .	. <u>.</u>
1et SECTION	ENGINE DESCRIPTION	•	3
2nd SECTION	INSTALLATION		4
and SECTION	LIFE LIMITED PARTS OR OVERHAUL REQUIREMENTS		
4th SECTION	AIRWORTHINESS DIRECTIVE COMPLIANCE	•	•
5th SECTION	FACTORY SERVICE BULLETIN COMPLIANCE		12
se Section	INSPECTION AND MAINTENANCE RECORD		16

## **ENGINE DESCRIPTION**

MANUFACTURER	- y coming	LLUSON	MODE	756 A9		
SERIAL NUMBER	BE 10/2	F7 DATE OF M	AMDEACTION	c	•	
		RPM	AND TORE	MANIFOLD PRESSURE		<del>***</del>
	E/PERFORMANCE					
REGISTERED OWNER _	HAWKING 2441 HIG	3 Powers	AUIATIO	ok/		
STREET & NO.	2441 HIG	HWAY 14	<del></del>	<u> </u>		
CITY, STATE, ZIP	Greybull	WY BZ	426			
DATE PURCHASED_		DATE SOLD			·	
REGISTERED OWNER _						
STREET & NO						
CITY, STATE, ZP						
DATE PURCHASED	<del></del>	DATE SOLD				
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ec 19	4463	I certify this FRID has been inspected in ac
ec ! 1	1 1 2 2	conducte with the procedures of an FAA Approved
		Inspection Program per FAR 91 169 (f) (5), and
	1	was determined to be in airworthy condition.
		Total Time: 4N 13
<u></u>	<u> </u>	Signed Date 12-27.50
	l	HAWKINS & POWERS AVIATION, INC.
		FAA CRS
	<del>                                     </del>	GREYBULL, WYOMING
		11-July-1990 Total Times 56203 hrs.
		I certify this engine has been inspected
		in accordance with an FAA approved
		inspection programated determined to be
		ask worthy.
		TAR CRS#
		Hamiting & Parera Augution
		Granbully lery

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	 was determined to be in airworthy condition.	
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	Signed Date 3 16-41 HAWKINS & POWERS AVIATION INC	
	 FAA CRS	
·	GREYBULL, WYOMING	
	No. of the second secon	
	 1 certify this Charles been inspected in ac	
	 corriance with the procedures of an FAA Approved	
	Inspection Program per FAR 91.409 (f) (4), 13d	
	was determined to be in airworthy condition.  Total First: 444 83 9775, 02	
	Signed 11 11 11 Date 3-20-42	
	HAWKINS & POWERS AVIATION, INC.	
	FAA CRS CREYBULL, WYOMING	P
	 OKETBOLL, WTOMING	

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DATE	TOTAL TIME	INSPECTION OR MAINTENANCE PERFORMED AGENCY & CERTIFICATE NO.
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		cordance with the procedures of an FAA Approved
		Inspection Program per FAR 91.409 (f) (4), and
	<del></del>	was determined to be in airworthy condition:
		Total Time: 9841, 57
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		HAWKINS & POWERS AVIATION, INC.
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20-94	9877. 91	certify this has been inspected in ac
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		was determined to be in airworthy condition.
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		HAWKINS & POWERS AVIATION INC
		FAA CRS
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		INSPECTION & MAINTENANCE RECORD
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		2J-T56-16 S/N AT-T901389, REPLACED
		ALL (GEA) FUEL NOZZIES, ENG STARTER
		FUEL CONTROL, T.D AMP. TO VALUE 3
		DC GEN SEE HAWKINS 3 POWERS
		WO # 96-1225 FOR DETAILS-
		M. 18) LAWKINS ? POWERS
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-		T.S.D 1/63.8
2 AUG 19	196 9618.6	
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DATE	TOTAL TIME	INSPECTION OR MAINTENANCE PERFORMED AGENCY & CERTIFICATE NO.
8 AUG 199	96/8.8	PERFORMEN HAWKING 3 HOWERS HP-C-13
		"C' CHER INSPECTION TT 96188 -
	<u> </u>	T.S.O 1163.8 REF WG# 96-1225
		MANKIAS JYOLON
0FD 1004		
3, SEP 199	96/8.8	Installed Engine #3 Position
		T-130 TAT 20606.86 Engine TSO 1/63
		OPST leak check good, T.A.W.
	<del></del>	1C-130A-2-4+ 1C-130A-2-11. Fng.
		Performance 103.0. See Hawkinst
		PODERS W.O. # 96-1962 For detail
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5/10/97	7.50 1221.39	This QEC has been modified for the installation of HP-C-130AChip Detector Circuit per 337 for the following aircraft: T-131-337 dated 6/6/97, T-130-337 dated 5/10/97, T-133-337 dated 5/21/97	

			INSPECTION & MAINTENANCE RECORD
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			in accordance with a <u>Collect</u> inspection
_			and was determined to be in airworthy condition.
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_			Date of San A/C/Lag. Total Time 2/40/, 34 113
			FAA CRS BZBR701C Work Order No. 10407
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			Date D	///A	/C/Fine	Total Time	2769	5,60	
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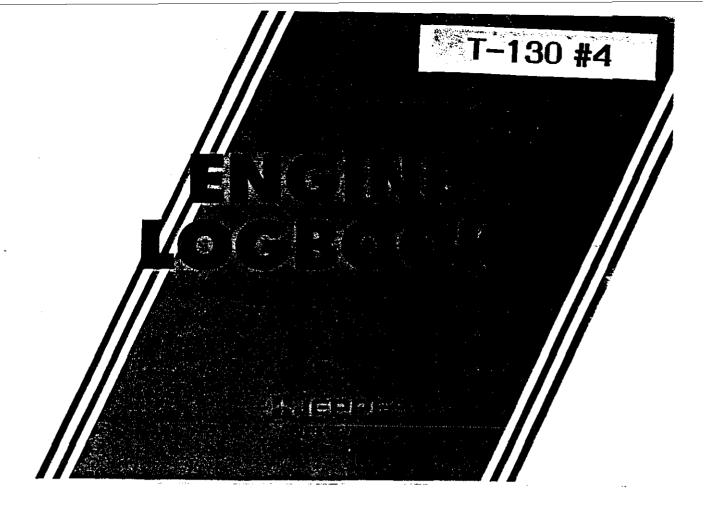
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Appendix E.

Engine #4

Logbook

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**EA-ELB** 

# **ENGINE LOGBOOK**

Logbook	No	C	) <u> </u>	IE		
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To		,				

© Jeppesen Sanderson, Inc., 1988
All Rights Reserved
55 Inverness Drive East, Englewood, CO 80112-5498

# **ENGINE DESCRIPTION**

MANUFACTURER	ALLISION		_ MODEL	6 A90	
	E100814				3
RATED BHP/SHP/THRUS	т	RPM	MANFOLD	PRESSURE	
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INS. FUEL FLOW TRANSMITTER, COURDINATE

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"C" SERVICE AND INSPECTION BUIDE.

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CLW I.A.W IC-130A-2-4, IC-130A-PA

1-163 IC-130B-2-11 REF WO\* 129EN.

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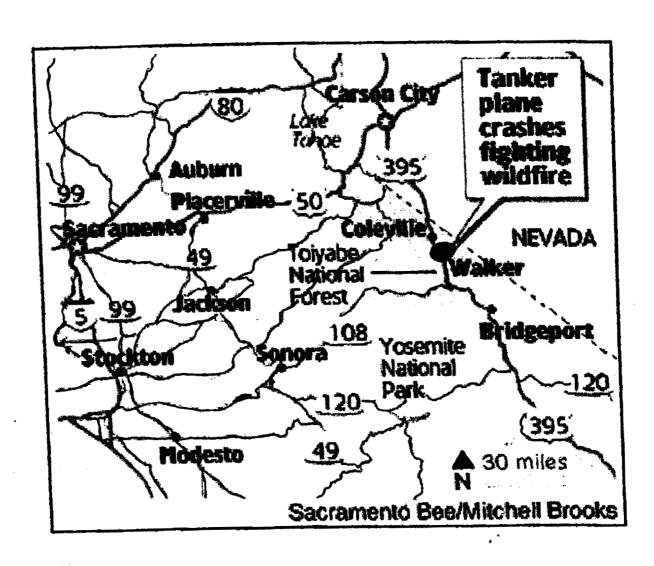
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Appendix F.

Map

Of the

Area



# Appendix G. – Participants

# Walker, California, June 18-20, 2002

Mr. George Peterson	NTSB	IIC	
Mr. Pierre Scarfo	NTSB	Party	
Mr. Mike Weber	Rolls-Royce	Party	
Mr. George James	Lockheed Martin	Party	
Mr. Carl Meyer	Hawkins & Powers	Party	Unknown
Mr. Bill Bulger	Forest Service	Party	Unknown
Mr. William Kunger	FAA	Party	

