

NATIONAL TRANSPORTATION SAFETY BOARD
 ACCIDENT FILE CONTENTS *gm*

PAGE 1 OF 1 PAGES

TRANSPORTATION MODE AVIATION HIGHWAY PIPELINE
 INTERMODAL MARINE RAILROAD

NTSB FILE NO.

IDENTIFICATION OF ACCIDENT PALMER, ALASKA
 DE HAVILLAND DHC-3, N41755
 JUNE 20, 1989
 ANC89-I-A099

ITEM NO.	DESCRIPTION OF ITEM	NO. OF PAGES		
		DOC.	B&W PHOTO	COLOR PHOTO
1.	NTSB Form 6120.3, Accident File Contents	1		
2.	NTSB Form 6120.4, Factual Report Aviation Accident/Incident Pages 1,2,2a,3,4,5,6,7,8,9	10		
3.	NTSB Form 6120.4, Supplement S, Page 1	1		
4.	Chemical And Geological Laboratories Report Of Grease Samples	5		
5.	Diagram Of Stabilizer Trim Actuator	1		
5.	Statement Of Party Representatives To NTSB Investigation	1		
TOTAL NUMBER OF PAGES		19		



**FACTUAL REPORT
AVIATION
ACCIDENT/INCIDENT**

**National Transportation Safety Board
Washington, D.C. 20594**

10

NTSB Form 6120.4

Instructions

Unless otherwise stated in the instructions or on the form, all data fields must be completed. Each data field requires either a direct entry or the entry of one or more x's in appropriate blocks that best describe the mishap circumstances. Multiple entry fields may require two or more responses. Enter all applicable responses in multiple entry fields. When the selections offered are inappropriate, a two digit "other" code shall be entered in the space that follows the word "other." Do not make additional remarks in the margins as the automated data processor is not programmed to accept them. Any information which is needed to outline the sequence of events which preceded the occurrence, to support probable cause determination or which is pertinent to crashworthiness studies should be addressed in the narrative report.

"Other" Codes

- | | |
|----|----------------------------------------------------------------------------------------------------------|
| 01 | Limited access to and/or limited time available at site. |
| 02 | Aircraft not recovered/missing. |
| 03 | Part/component not recovered/not located. |
| 04 | Aircraft too badly damaged to determine. |
| 05 | Part/component too badly damaged to determine. |
| 06 | Information not pertinent to accident/incident. |
| 07 | Applicable personnel could not provide information or information not available to applicable personnel. |
| 08 | Applicable personnel would not provide information. |
| 09 | Not installed. |
| 10 | Records not located/not available. |
| 11 | Information not entered on NTSB Form 6120.1. |
| 12 | See narrative report. |

Supplements

The following accident scenarios are provided to assist investigators in selecting the report forms which should supplement the basic NTSB Form 6120.4.

1. A Cessna 172 collided with a snowbank during landing goaround at an airport. Weather was not a factor. The pilot said there was no powerplant or control malfunction. The pilot and one passenger received minor injuries. The pilot had recently been certificated as a private pilot.

Complete supplemental forms F (Training and Proficiency), Q (Airport) and S (Occupant list). A "Limited" investigation should be completed.

2. A PA-31, being operated by two pilots under FAR 135, crashed into a tower while being vectored to intercept the localizer at the destination airport. The PA-31 struck the tower while being operated at an assigned altitude. Flight was in IMC. There were two fatal injuries and three serious injuries. CFR personnel responded and treated the injured.

This accident requires an onscene investigation. Thus supplement A (Wreckage documentation), B (Cockpit documentation) and I (Crash kinematics) are required. Supplements E (Second pilot), F (Training and Proficiency) and U are required because of the two pilot FAR 135 operation (even though proficiency may not be at issue). S is needed to list the occupants; T, to document the CFR activity and P, to cover the possible ATC involvement. R (Meteorology) is required to document the weather conditions. Copies of supplements K and L would be required to document injury/toxicology and seat/restraint damage information, respectively.

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National Transportation Safety Board

FACTUAL REPORT
AVIATION

1 NTSB Accident/Incident Number

A | N | C | 8 | 9 | I | A | 0 | 9 | 9 |

2

1 Accident
2 Incident

3 Investigation

1 NTSB
2 FAA Delegated

4 Aircraft Registration Number

N41755

5 Flight Number

A Other

For collision between
aircraft, enter reg. no.
and flt. no. for other aircraft

6 Aircraft Registration Number

7 Flight Number

A Other

8 Nearest City/Place

Palmer

9 State

AK

10 Zip Code (First 5 numbers only)

99645

11 Accident Site Elevation

1000 Feet MSL

12 Date of Accident (Nos. for M, D, Y)

06/20/89

13 Day of Week (First 2 letters)

TU

14 Local Time (24 hour clock)

1345

15 Time Zone

ADT

16 Narrative Statement of Facts, Conditions and Circumstances Pertinent to the Accident/Incident

History of Flight

On June 20, 1989, at approximately 1345 Alaska Daylight Time (a.d.t.), a wheel equipped de Havilland DHC-3 airplane, N41755, sustained an inflight failure of the stabilizer trim actuator. The Commercial Pilot and his sole passenger, an Office of Aircraft Services (OAS) check pilot, were not injured in the incident. The airplane was being operated as a business flight by Woods Air Service in the vicinity of Palmer, Alaska, under 14 CFR Part 91 at the time of the incident. The flight originated in Palmer, Alaska, at 1230 a.d.t. Visual meteorological conditions prevailed, and a company flight plan was filed.

The pilot reported that he was nearing the Palmer Airport in preparation for landing. He had just reduced the power and made a slight nose-up adjustment of the stabilizer trim. Simultaneous with the trim adjustment, a loud bang was heard and the nose quickly pitched down. The pilot, along with the OAS Pilot sitting in the right front seat, both pulled the control wheel backwards against strong resistance to raise the nose. By continuing to exert back pressure and adding nearly maximum power, the two pilots were able to regain a level attitude and make a successful landing at Palmer.

A post-flight inspection by Woods Air Service personnel revealed a broken stabilizer trim actuator assembly.

Additional Persons Participating in this Accident/Incident Investigation (Name, address, affiliation. Continue on page 2 if necessary)

NONE

17 Date (Nos. for M, D, Y)

10/19/89

18 Agency

Anchorage NTSB

19 Name/Signature

James D. La Bel

National Transportation Safety Board

**FACTUAL REPORT
AVIATION**

NTSB Accident/Incident Number

A | N | C | 8 | 9 | I | A | 0 | 9 | 9

16 Narrative Statement of Facts, Conditions and Circumstances Pertinent to the Accident/Incident (continued)

Aircraft Information

N41755 is a de Havilland DHC-3 airplane assigned serial number 339. It is powered by a single Pratt and Whitney radial R-1340 reciprocating gasoline engine rated at 600 horsepower. Reported total time on the airframe at the time of the incident was 9,750 hours.

Tests and Research

The stabilizer trim actuator assembly was disassembled by NTSB and OAS personnel at the OAS Aircraft Maintenance Facility in Anchorage, Alaska.

The actuator assembly is a jack screw which is attached to the leading edge of the horizontal stabilizer. It is moved by a cable that is attached to the trim control in the cockpit. The cable winds around the grooved outer body of the actuator assembly. Inside the actuator is a threaded steel shaft which fits into an aluminum sleeve. The threaded steel shaft is attached to the outer casing, and as the outer casing is moved by the adjusting cable, the steel shaft moves in or out of the aluminum sleeve, changing the length of the jack screw and thus changing the angle of the stabilizer.

Disassembly of the actuator revealed that the aluminum sleeve which the steel shaft threads into was totally without threads. The steel shaft could be moved in and out of the sleeve without resistance, even though the adjusting collar on the end of the aluminum sleeve was still in place. The steel shaft was thinly greased. The color of the grease was predominantly gray, giving the appearance of containing particulate matter from the ground up threads of the aluminum sleeve. The bottom interior of the sleeve contained numerous large pieces of the former aluminum threads. The threaded steel shaft was undamaged.

Grease samples were taken and analyzed to see if they met the criteria specified by de Havilland Aircraft Corporation. de Havilland calls for two different types of lubricants to be used in the upper and lower actuator halves. The type of test conducted on the greases was not definitive as to their exact composition, but did indicate that they were of two different types. Visual examination of the greases gave the impression of being the appropriate types, but both greases appeared stiffer and slightly filmed over when compared to new greases.

Attach additional pages as necessary (Page 2a, 2b, 2c, etc)

Page 2

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NTSB Accident/Incident Number

A | N | C | 8 | 9 | I | A | 0 | 9 | 9 |

16 Narrative Statement of Facts, Conditions and Circumstances Pertinent to the Accident/Incident (continued)

Additional Information

Log book records indicate that the a "new serviceable" actuator was installed on February 10, 1981. If the actuator was new in the meaning that it had not seen previous service since manufacture, then it would have had approximately 4,304 hours of service when it failed. Accurate service records depicting when the part was serviced (hand packed with grease and routinely lubricated) were not available.

A search of Federal Aviation Administration (FAA), and NTSB records, as well as conversations with de Havilland Aircraft Corporation personnel, disclosed no prior failures of this part.

The Operator of the airplane noted that the airplane had been flown in extremely cold weather, and that this may have created lubrication problems which lead to a premature failure.

Attach additional pages as necessary (Page 2a, 2b, 2c, etc.)

**National Transportation Safety Board
FACTUAL REPORT
AVIATION**

NTSB Accident/Incident Number:

AW1891IA10191

Report/Approach/Landing Information 24 Not applicable (Go to block 39)

25 Airport Name <i>Palmer</i> A Other _____	26 Airport Identifier <i>PAQ</i>	27 Accident Location 1 <input checked="" type="checkbox"/> Off airport/airstrip 2 <input type="checkbox"/> On airport 3 <input type="checkbox"/> On airstrip A Other _____	28 Distance From Airport Center (Nearest SM) _____ SM A Other <i>06</i>	29 Direction From Airport _____ °mag A Other <i>06</i>
----------------------------------------------------------	--------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------	---------------------------------------------------------------------

30 VFR Approach/Landing (Multiple entry) 1 <input type="checkbox"/> None 2 <input checked="" type="checkbox"/> Traffic pattern 3 <input type="checkbox"/> Straight-in 4 <input type="checkbox"/> Valley/terrain following 5 <input type="checkbox"/> Go around 6 <input type="checkbox"/> Touch and go 7 <input type="checkbox"/> Full stop 8 <input type="checkbox"/> Stop and go 9 <input type="checkbox"/> Simulated forced landing 10 <input type="checkbox"/> Forced landing 11 <input type="checkbox"/> Precautionary landing A Other _____	31 Type Instrument Approach Flow (Multiple entry) 1 <input checked="" type="checkbox"/> None 2 <input type="checkbox"/> ADF/NDB 3 <input type="checkbox"/> SDF 4 <input type="checkbox"/> VOR/TVOR 5 <input type="checkbox"/> VOR/DME 6 <input type="checkbox"/> TACAN 7 <input type="checkbox"/> ILS-complete 8 <input type="checkbox"/> ILS-localizer 9 <input type="checkbox"/> ILS-backcourse 10 <input type="checkbox"/> RNAV 11 <input type="checkbox"/> MLS 12 <input type="checkbox"/> LDA 13 <input type="checkbox"/> ASR 14 <input type="checkbox"/> PAR 15 <input type="checkbox"/> Sidestep 16 <input type="checkbox"/> Visual 17 <input type="checkbox"/> Contact 18 <input type="checkbox"/> Circling 19 <input type="checkbox"/> Practice A Other _____	32 Runway Used Identifier _____ A Other <i>06</i> <hr/> 33 Runway Length _____ Feet A Other <i>06</i> <hr/> 34 Runway Width _____ Feet A Other <i>06</i> <hr/> 35 Airport Elevation _____ Ft MSL A Other <i>06</i>
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36 Runway/Landing Surface 1 <input type="checkbox"/> Macadam 2 <input type="checkbox"/> Asphalt 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Gravel 5 <input type="checkbox"/> Dirt 6 <input type="checkbox"/> Grass/turf 7 <input type="checkbox"/> Snow 8 <input type="checkbox"/> Ice 9 <input type="checkbox"/> Water 10 <input type="checkbox"/> Metal/wood A Other <i>06</i>	37 Runway/Landing Surface Condition 1 <input type="checkbox"/> Dry 2 <input type="checkbox"/> Wet 3 <input type="checkbox"/> Ice covered 4 <input type="checkbox"/> Snow—dry 5 <input type="checkbox"/> Snow—wet 6 <input type="checkbox"/> Snow—crusted 7 <input type="checkbox"/> Snow—compacted 8 <input type="checkbox"/> Vegetation 9 <input type="checkbox"/> Water—calm 10 <input type="checkbox"/> Water—choppy 11 <input type="checkbox"/> Water—glassy 12 <input type="checkbox"/> Rubber deposits 13 <input type="checkbox"/> Soft 14 <input type="checkbox"/> Rough 15 <input type="checkbox"/> Slush covered 16 <input type="checkbox"/> Holes A Other <i>06</i>
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If accident occurred during approach, departure or on airport, see instructions for completing Supplement Q.

38 Aircraft Manufacturer <i>de Havilland</i>	39 Aircraft Model/Series <i>DHC-3</i>	40 Serial No. <i>339</i> A Other _____	41 Certified Maximum Gross Weight _____ A Other <i>06</i>
42 Type of Aircraft 1 <input checked="" type="checkbox"/> Airplane 2 <input type="checkbox"/> Helicopter 3 <input type="checkbox"/> Glider 4 <input type="checkbox"/> Balloon 5 <input type="checkbox"/> Blimp/dirigible 6 <input type="checkbox"/> Ultralight 7 <input type="checkbox"/> Gyroplane A Specify _____	43 Type Airworthiness Certificate (Multiple entry) Standard 1 <input checked="" type="checkbox"/> Normal 2 <input type="checkbox"/> Utility 3 <input type="checkbox"/> Acrobatic 4 <input type="checkbox"/> Transport Special 5 <input type="checkbox"/> Restricted 6 <input type="checkbox"/> Limited 7 <input type="checkbox"/> Provisional 8 <input type="checkbox"/> Special flight 9 <input type="checkbox"/> Experimental A Other _____	44 Home Built 1 <input type="checkbox"/> Yes 2 <input checked="" type="checkbox"/> No A Other _____	

National Transportation Safety Board

**FACTUAL REPORT
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NTSB Accident/Incident Number

AMC 1819 IZA 101919

(continued)

Landing Gear (Multiple entry)

- | | | | | |
|-----------------------------------------------------------|--------------------------------------------------------|-----------------------------------------|---------------------------------------|---------------------------------------|
| 1 <input type="checkbox"/> Tricycle—fixed | 4 <input type="checkbox"/> Tailwheel—all retractable | 7 <input type="checkbox"/> Hull | 10 <input type="checkbox"/> Ski | 13 <input type="checkbox"/> High Skid |
| 2 <input type="checkbox"/> Tricycle—retractable | 5 <input type="checkbox"/> Tailwheel—retractable mains | 8 <input type="checkbox"/> Float | 11 <input type="checkbox"/> Ski/wheel | |
| 3 <input checked="" type="checkbox"/> Tailwheel—all fixed | 6 <input type="checkbox"/> Amphibian | 9 <input type="checkbox"/> Emerg. float | 12 <input type="checkbox"/> Skid | A Other |

1 No. of Seats 9 A Other	49 Stall Warning System Installed 1 <input checked="" type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other	50 IFR Equipped 1 <input type="checkbox"/> Yes 2 <input checked="" type="checkbox"/> No A Other	51 Icing Certification/Equipped (Multiple entry) 1 <input type="checkbox"/> Certified 2 <input checked="" type="checkbox"/> Not Certified 3 <input type="checkbox"/> Equipped 4 <input checked="" type="checkbox"/> Not Equipped A Other	52 Engine Type 1 <input checked="" type="checkbox"/> Reciprocating—carburetor 2 <input type="checkbox"/> Reciprocating—fuel injected 3 <input type="checkbox"/> Turbo prop 4 <input type="checkbox"/> Turbo jet 5 <input type="checkbox"/> Turbo fan 6 <input type="checkbox"/> Turbo shaft A Other

53 Engine Manufacturer <i>PRATT & WHITNEY</i>	54 Engine Model and Series <i>R-1340</i>	55 Engine Rated Power A <i>600</i> Horsepower B _____ Lbs. Thrust C Other	56 Number of Engines 1 A Other
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If 3 or more engines enter times in Supp. C	Engine Time (Hours) A Total Time	B Time Since Inspection	C Time Since Major Overhaul	D Other
	57 Engine No. 1			//
	58 Engine No. 2			//

59 Type Maintenance Program 1 <input type="checkbox"/> Annual 2 <input type="checkbox"/> Manufacturer's Inspection Program 3 <input checked="" type="checkbox"/> Other approved inspection program (AAIP) 4 <input type="checkbox"/> Continuous airworthiness A Other	60 Type of Last Inspection 1 <input type="checkbox"/> Annual 2 <input checked="" type="checkbox"/> 100 hour 3 <input type="checkbox"/> AAIP 4 <input type="checkbox"/> Continuous airworthiness A Other	61 Date Last Inspection Performed (Nos. for M, D, Y) <i>6-15-89</i> A Other	62 Time Since inspection _____ Hours A Other //
			63 Airframe Total Time <i>9750</i> Hours A Other

64 Source of Maintenance Information 1 <input type="checkbox"/> Tach 2 <input type="checkbox"/> Flight 3 <input type="checkbox"/> Hobbs 4 <input type="checkbox"/> Logbooks Records 5 <input type="checkbox"/> Estimate 6 <input type="checkbox"/> Pilot/Operator Report A Other	65 Hazardous Materials on Aircraft 1 <input checked="" type="checkbox"/> No A (Type) _____ B Other	Emergency Locator Transmitter (ELT)	1 Yes 2 No A Other
		67 Installed	<input checked="" type="checkbox"/>
		68 Required	<input checked="" type="checkbox"/>
		69 Operated	<input checked="" type="checkbox"/>
		70 Aided in location of accident site	<input checked="" type="checkbox"/>

71 Registered Aircraft Owner Name <i>WOODS, WARREN G.</i>	72 Address <i>PAIMOR, AK. 99645</i>
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73 Operator of Aircraft 1 <input checked="" type="checkbox"/> Same as registered owner A Name: B dba C Other	74 Address 1 <input checked="" type="checkbox"/> Same as registered owner A _____ B Other	75 Operator Certificate No. _____ 76 Operator Designator Code <i>EOXA</i>
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**National Transportation Safety Board
FACTUAL REPORT
AVIATION**

NTSB Accident/Incident Number

AW1819 JTA 999

Operator/Operator Information

Operator Status of This Aircraft 1 <input checked="" type="checkbox"/> Owner 2 <input type="checkbox"/> Lessee 3 <input type="checkbox"/> Renter 4 <input type="checkbox"/> Borrower 5 <input type="checkbox"/> Unauthorized A Other		78 Pilot Status of This Aircraft 1 <input checked="" type="checkbox"/> Owner 2 <input type="checkbox"/> Lessee 3 <input type="checkbox"/> Renter 4 <input type="checkbox"/> Borrower 5 <input type="checkbox"/> Unauthorized 6 <input type="checkbox"/> Employee A Other	
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Type of Certificate(s) Held 79 None (Go to block 83)

80 Air Carrier Operating Certificate (Check all applicable) 1 <input type="checkbox"/> Flag carrier/domestic (121) 2 <input type="checkbox"/> Supplemental 3 <input type="checkbox"/> All cargo (418) 4 <input type="checkbox"/> Large helicopter (127) 5 <input type="checkbox"/> Commuter air carrier 6 <input checked="" type="checkbox"/> On-demand air taxi	81 Operating Certificate <input type="checkbox"/> Other operator of large aircraft	82 Operator Certificate 1 <input type="checkbox"/> Rotorcraft—external load operator (133) 2 <input type="checkbox"/> Agricultural aircraft (137)
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Regulation Flight Conducted Under

Regulation Flight Conducted Under

1 <input checked="" type="checkbox"/> 14 CFR 91 (only)	4 <input type="checkbox"/> 14 CFR 105	7 <input type="checkbox"/> 14 CFR 127	10 <input type="checkbox"/> 14 CFR 137
2 <input type="checkbox"/> 14 CFR 91D	5 <input type="checkbox"/> 14 CFR 121	8 <input type="checkbox"/> 14 CFR 133	11 <input type="checkbox"/> 14 CFR 129 (Foreign flag)
3 <input type="checkbox"/> 14 CFR 103	6 <input type="checkbox"/> 14 CFR 125	9 <input type="checkbox"/> 14 CFR 135	A Specify _____

Type of Flight Operation Conducted

Complete 84a, b, c ONLY if flight was a revenue operation conducted under 121, 125, 127, 129, 135)

84a 1 <input type="checkbox"/> Scheduled 2 <input type="checkbox"/> Non-scheduled	84b 1 <input type="checkbox"/> Domestic 2 <input type="checkbox"/> International	84c 1 <input type="checkbox"/> Passenger 2 <input type="checkbox"/> Cargo 3 <input type="checkbox"/> Passenger/cargo 4 <input type="checkbox"/> Mail contract ONLY
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Complete 86 ONLY if 84a, b, c is not applicable)

1 <input type="checkbox"/> Personal	4 <input type="checkbox"/> Executive/corporate	7 <input type="checkbox"/> Other work use	10 <input type="checkbox"/> Positioning
2 <input checked="" type="checkbox"/> Business	5 <input type="checkbox"/> Aerial application	8 <input type="checkbox"/> Public use	
3 <input type="checkbox"/> Instructional (Including air carrier training)	6 <input type="checkbox"/> Aerial observation	9 <input type="checkbox"/> Ferry	A Specify _____

Pilot Information

7 Name (Last, First, Initial) <u>Woods, Warren G.</u> A Other _____	80 Pilot Certificate No. [Redacted] A Other _____	81 Pilot License No. [Redacted] A Other _____
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8 City <u>Palmer</u> A Other _____	81 State <u>AK</u>	82 Date of Birth (Nos. for M, D, Y) <u>06</u> A Other _____	83 Age _____ Yrs. A Other <u>06</u>	84 Sex 1 <input checked="" type="checkbox"/> Male 2 <input type="checkbox"/> Female
-------------------------------------------------	------------------------------	--------------------------------------------------------------------------	--------------------------------------------------	--------------------------------------------------------------------------------------------------

85 Seat Occupied 1 <input checked="" type="checkbox"/> Left 2 <input type="checkbox"/> Right 3 <input type="checkbox"/> Center 4 <input type="checkbox"/> Front 5 <input type="checkbox"/> Rear A Other _____	86 Principal Profession 1 <input checked="" type="checkbox"/> Pilot—civilian 2 <input type="checkbox"/> Pilot—military 3 <input type="checkbox"/> Other—military 4 <input type="checkbox"/> Aircraft mechanic 5 <input type="checkbox"/> Business 6 <input type="checkbox"/> Lawyer 7 <input type="checkbox"/> Doctor/dentist 8 <input type="checkbox"/> Police 9 <input type="checkbox"/> Student 10 <input type="checkbox"/> Clergy 11 <input type="checkbox"/> Teacher 12 <input type="checkbox"/> Engineer 13 <input type="checkbox"/> Farmer/rancher 14 <input type="checkbox"/> Retired A Other _____	87 Certificate(s) (Multiple entry) 1 <input type="checkbox"/> Student 2 <input type="checkbox"/> Private 3 <input checked="" type="checkbox"/> Commercial 4 <input type="checkbox"/> Airline Transport 5 <input type="checkbox"/> Flight Instructor 6 <input type="checkbox"/> Flight Engineer 7 <input type="checkbox"/> Military 8 <input type="checkbox"/> None 9 <input type="checkbox"/> Foreign A Other _____
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National Transportation Safety Board

**FACTUAL REPORT
AVIATION**

NTSB Accident/Incident Number

AWC 89 IA 099

(Multiple entry - blocks 98-102)

<p>98 Ratings—Airplane</p> <p>1 <input type="checkbox"/> None 2 <input checked="" type="checkbox"/> Single engine land 3 <input checked="" type="checkbox"/> Multiengine land 4 <input checked="" type="checkbox"/> Single engine sea 5 <input type="checkbox"/> Multiengine sea</p>	<p>99 Rotorcraft/Glider/LTA</p> <p>1 <input checked="" type="checkbox"/> None 2 <input type="checkbox"/> Helicopter 3 <input type="checkbox"/> Gyroplane 4 <input type="checkbox"/> Airship 5 <input type="checkbox"/> Free balloon 6 <input type="checkbox"/> Glider</p>	<p>100 Instrument Rating</p> <p>1 <input type="checkbox"/> None 2 <input checked="" type="checkbox"/> Airplane 3 <input type="checkbox"/> Helicopter</p>	<p>101 Instructor Rating(s)</p> <p>1 <input checked="" type="checkbox"/> None 2 <input type="checkbox"/> Airplane SE 3 <input type="checkbox"/> Airplane ME 4 <input type="checkbox"/> Helicopter 5 <input type="checkbox"/> Gyroplane</p> <p>6 <input type="checkbox"/> Glider 7 <input type="checkbox"/> Instrument plane 8 <input type="checkbox"/> Instrument helicopter</p>
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<p>102 Ground Instructor</p> <p>1 <input checked="" type="checkbox"/> None 2 <input type="checkbox"/> Basic 3 <input type="checkbox"/> Advanced 4 <input type="checkbox"/> Instrument</p>	<p>103 Type Rating Endorsement This Aircraft</p> <p>1 <input type="checkbox"/> Yes 2 <input checked="" type="checkbox"/> No (Go to block 105) A Other</p>	<p>104 Months Since Check/Endorsement This Aircraft</p> <p>_____ Months A Other</p>	<p>105 Biennial Flight Review (Or equivalent)</p> <p>1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other //</p>
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<p>106 Months Since Last BFR</p> <p>_____ Months A Other //</p>	<p>107 BFR (or equivalent) Aircraft Make/Model</p> <p>A Make _____ B Model _____ C Other //</p>	<p>108 Medical Certificate</p> <p>1 <input type="checkbox"/> None 2 <input type="checkbox"/> Class 1 3 <input type="checkbox"/> Class 2 4 <input type="checkbox"/> Class 3 A Other //</p>	<p>109 Medical Certificate Validity</p> <p>1 <input type="checkbox"/> Valid medical—no waivers/limitations 2 <input type="checkbox"/> Valid medical—with waivers/limitations 3 <input type="checkbox"/> Non valid medical for this flight 4 <input type="checkbox"/> Expired 5 <input type="checkbox"/> No medical certificate A Other //</p>
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<p>110 Date of Last Medical (Nos. for M, D, Y)</p> <p>_____ A Other //</p>	<p>111 Medical limitation</p> <p>1 <input type="checkbox"/> None 2 <input type="checkbox"/> Vision A Specify _____ B Other //</p>	<p>112 Medical waiver</p> <p>1 <input type="checkbox"/> None 2 <input type="checkbox"/> Vision 3 <input type="checkbox"/> Hearing A Specify _____ B Other //</p>	<p>113 Statement of Demonstrated Ability</p> <p>1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other //</p>
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<p>114 Correcting Lenses (Multiple entry)</p> <p>1 <input type="checkbox"/> Not required 2 <input type="checkbox"/> Required to be in possession 3 <input type="checkbox"/> Required, not in possession 4 <input type="checkbox"/> Required to be worn 5 <input type="checkbox"/> Required, not worn 6 <input type="checkbox"/> Worn at time of accident A Other //</p>	<p>115 Source of Pilot Flight Time (Multiple entry)</p> <p>1 <input type="checkbox"/> Pilot log 2 <input type="checkbox"/> Company 3 <input type="checkbox"/> FAA 4 <input type="checkbox"/> Pilot/Operator Report 5 <input type="checkbox"/> Investigator's Estimate 6 <input type="checkbox"/> Relative 7 <input type="checkbox"/> Other Person A Other //</p>
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Flight Time	A All A/C	B This Make & Model	C Airplane Single Engine	D Airplane Multiengine	E Night	F Instrument Actual	G Instrument Simulated	H Rotorcraft	I Glider	J Lighter Than Air	K Other
125 Total Time											//
126 Pilot in Command (PIC)											//
127 Instructor											//
128 This Make/Model											//
129 Last 90 Days											//
130 Last 30 Days											//
131 Last 24 Hours											//

<p>132 Landings—Last 90 Days All Aircraft</p> <p>_____ Day A Other <u>06</u></p>	<p>133 Landings—Last 90 Days All Aircraft</p> <p>_____ Night A Other <u>06</u></p>	<p>134 Landings—Last 90 Days This Make/Model</p> <p>_____ Day A Other <u>06</u></p>	<p>135 Landings—Last 90 Days This Make/Model</p> <p>_____ Night A Other <u>06</u></p>
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<p>136 Seatbelt Available</p> <p>1 <input checked="" type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other</p>	<p>137 Seatbelt Used</p> <p>1 <input checked="" type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other</p>	<p>138 Shoulder Harness Available</p> <p>1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other //</p>
<p>139 Shoulder Harness Used</p> <p>1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other //</p>	<p>140 Autopsy Performed (This pilot)</p> <p>1 <input type="checkbox"/> Yes 2 <input checked="" type="checkbox"/> No A Other</p>	<p>141 Toxicology Performed (This pilot)</p> <p>1 <input type="checkbox"/> Yes 2 <input checked="" type="checkbox"/> No A Other</p>

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**National Transportation Safety Board
FACTUAL REPORT
AVIATION**

NTSB Accident/Incident Number

AWC1819 JAO 99

142 Person at Controls

- 1 Pilot in command
 2 Second pilot
 3 Both pilots
 4 Non-pilot
 5 No one
 A Other

143 Simulated Instrument Flight

- 1 Yes
 2 No
 A Other

144 Vision Restricting Device Used

- 1 Yes
 2 No
 A Other

145 Second Pilot

- 1 Yes (Complete second pilot supplement)
 2 No

155 Last Departure Point (Multiple entry)

- 1 Same as accident/incident location or
 A Airport identifier PAG
 B City/Place PAIMER
 C State AK D Other

157 Destination (Multiple entry)

- 1 Same as accident/incident location or
 2 Local flight
 A Airport Identifier _____
 B City/Place _____
 C State _____
 D Other

158 Flight Plan Filed (Multiple entry)

- 1 None
 2 Visual Flight Rules (VFR)
 3 Instrument Flight Rules (IFR)
 4 VFR/IFR
 5 Company (VFR)
 6 Military (VFR)
 A Other

156 Time of Departure

- A Time 1230 C Other
 B Time Zone ADT

160 Type of Clearance

- 1 None
 2 VFR
 3 Special VFR
 4 IFR
 5 Special IFR
 6 VFR on top
 7 Cruise
 8 Traffic Advisory
 9 VFR Flight Following
 A Other

160 Airspace

- 1 Uncontrolled
 2 Controlled
 3 Airport traffic area
 4 Control zone
 5 Airport advisory area
 6 Positive control area
 7 Terminal control area
 8 Stage II TRSA
 9 Stage III TRSA
 10 Prohibited area
 11 Restricted area
 12 Military Operating Area (MOA)
 13 Student Jet Training Area
 14 Demo Area
 15 Warning area
 16 FAR 93 (Special air traffic areas)
 A Other

161 Control Area

- 1 None
 2 Victor airway
 3 Jet airway
 4 Control airway
 5 Colored airway
 A Other

162 Route

- 1 None
 2 Standard instrument departure
 3 Standard terminal arrival
 4 RNAV/OMEGA/LCRAN/INS
 5 Direct
 6 Profile Descent
 7 VR route (military)
 8 IR route (military)
 9 SR route (military)
 10 Refueling route (military)
 A Other

163 Last Two Way Communications Established

- 1 None
 2 Yes
 A Facility Identifier PAG FSS
 B Other

164 Fuel on Board at Takeoff (Multiple entry)

- 1 Estimated
 2 Verified
 A _____ Gallons or
 B _____ Pounds
 C Other 06

165 Fuel Types (Multiple entry)

- 1 80/87
 2 100 low lead
 3 100/130
 4 115/145
 5 Kerosene
 6 JP 3, 4, 5, 6
 7 Jet A
 8 Jet B
 9 Mixture
 10 Automotive
 11 Anti-ice additive added (if known)
 A Other 06

166 Aircraft Weight at Takeoff (Multiple entry)

- 1 At or below max cert. gross takeoff weight
 2 Above max certified gross takeoff weight
 3 Estimated
 4 Verified
 A Other 06

167 Aircraft CG at Takeoff (Multiple entry)

- 1 Within limits
 2 Exceeded fwd limit
 3 Exceeded aft limit
 4 Exceeded lateral limit
 5 Estimated
 6 Verified
 A Other 06

168 Aircraft Weight at Accident (Multiple entry)

- 1 Same as takeoff
 2 At or below max cert. gross takeoff weight
 3 Above max certified gross takeoff weight
 4 Estimated
 5 Verified
 A Other 06

169 Aircraft CG at Accident (Multiple entry)

- 1 Same as takeoff
 2 Within limits
 3 Exceeded fwd limit
 4 Exceeded aft limit
 5 Exceeded lateral limit
 6 Estimated
 7 Verified
 A Other 06

**National Transportation Safety Board
FACTUAL REPORT
AVIATION**

NTSB Accident/Incident Number

AMC 891A099

170 Load Description (Multiple entry)

- | | | | | | |
|--------------------------------------------------|------------------------------------------|-------------------------------------------|-----------------------------------------|---------------------------------------|-------------------------------------------|
| 1 <input type="checkbox"/> None | 3 <input type="checkbox"/> Cargo | 5 <input type="checkbox"/> Towing banner | 7 <input type="checkbox"/> Parachutists | 9 <input type="checkbox"/> Chemical | 11 <input type="checkbox"/> Illegal cargo |
| 2 <input checked="" type="checkbox"/> Passengers | 4 <input type="checkbox"/> Towing glider | 6 <input type="checkbox"/> Other external | 8 <input type="checkbox"/> Water | 10 <input type="checkbox"/> Livestock | A Other |

180 Source of Weather Briefing (Multiple entry)

- | | |
|-------------------------------------------------------------------------------|-------------------------------------------------------|
| 1 <input checked="" type="checkbox"/> No record of briefing (Go to block 183) | 6 <input type="checkbox"/> Company |
| 2 <input type="checkbox"/> National Weather Service (NWS) | 7 <input type="checkbox"/> Commercial weather service |
| 3 <input type="checkbox"/> Flight Service Station | 8 <input type="checkbox"/> TV/radio weather |
| 4 <input type="checkbox"/> PATWAS (Pilot Automated Tel. WX Answering Svc) | 9 <input type="checkbox"/> Military |
| 5 <input type="checkbox"/> VRS (Voice Response System) | A Other |

181 Method of Briefing (Multiple entry)

- | |
|-------------------------------------------|
| 1 <input type="checkbox"/> In person |
| 2 <input type="checkbox"/> Teletype |
| 3 <input type="checkbox"/> Telephone |
| 4 <input type="checkbox"/> Aircraft radio |
| 5 <input type="checkbox"/> TV/radio |
| A Other |

182 Completeness of Weather briefing

- | |
|------------------------------------------------------------------|
| 1 <input type="checkbox"/> Weather not pertinent |
| 2 <input type="checkbox"/> Full |
| 3 <input type="checkbox"/> Partial—limited by pilot |
| 4 <input type="checkbox"/> Partial—limited by briefer/forecaster |
| A Other |

183 Investigator's Source of Weather Information

- | |
|---------------------------------------------------------------|
| 1 <input checked="" type="checkbox"/> Pilot (Go to block 185) |
| 2 <input type="checkbox"/> Witness (Go to block 185) |
| 3 <input type="checkbox"/> Weather observation facility |

184 Weather Observation Facility

- | |
|-----------------------------------------------|
| A Identifier _____ |
| B Time of observation _____ zone _____ |
| C Elevation _____ feet MSL |
| D Distance from accident site _____ NM |
| E Direction from accident site _____ magnetic |

185 Basic Weather Conditions at Accident Site

- | |
|------------------------------------------------------------------------------|
| 1 <input checked="" type="checkbox"/> Visual Meteorological Conditions (VMC) |
| 2 <input type="checkbox"/> Instrument Meteorological Conditions (IMC) |
| A Other |

186 Conditions of Light

- | |
|------------------------------------------------|
| 1 <input type="checkbox"/> Dawn |
| 2 <input checked="" type="checkbox"/> Daylight |
| 3 <input type="checkbox"/> Night (Dark) |
| 4 <input type="checkbox"/> Night (Bright) |
| 5 <input type="checkbox"/> Dusk |
| A Other |

187 Sky/Lowest/Cloud Condition

- | |
|-------------------------------------------------|
| 1 <input type="checkbox"/> Clear |
| 2 <input checked="" type="checkbox"/> Scattered |
| 3 <input type="checkbox"/> Thin broken |
| 4 <input type="checkbox"/> Thin overcast |
| 5 <input type="checkbox"/> Partial obscuration |
| A <u>8,000</u> Feet AGL |
| B Other |

188 Lowest Ceiling

- | |
|--------------------------------------------|
| 1 <input checked="" type="checkbox"/> None |
| 2 <input type="checkbox"/> Broken |
| 3 <input type="checkbox"/> Overcast |
| 4 <input type="checkbox"/> Obscured |
| A _____ Feet AGL |
| B Other |

189 Visibility (decimals)

- | |
|------------------|
| A <u>100</u> SM |
| B RVR _____ Feet |
| C RVV _____ SM |
| D Other |

190 Temperature

65 ° F
A Other

192 Wind (From)

- | |
|-------------------------------------|
| 1 <input type="checkbox"/> Variable |
| A _____ ° Magnetic |
| B Other |

193 Wind Speed

- | |
|-----------------------------------------------|
| 1 <input checked="" type="checkbox"/> Calm |
| 2 <input type="checkbox"/> Light and Variable |
| A _____ Kts. |
| B Other |

194 Gusts

- | |
|--------------------------------------------|
| 1 <input checked="" type="checkbox"/> None |
| A _____ Kts. |
| B Other |

195 Altimeter Setting

_____ "Hg
A Other 06

191 Dew Point

_____ ° F
A Other 06

196 Density Altitude

_____ Feet
A Other 06

197 Restrictions to Visibility

- | |
|-----------------------------------------------|
| 1 <input checked="" type="checkbox"/> None |
| 2 <input type="checkbox"/> Haze (H) |
| 3 <input type="checkbox"/> Dust (D) |
| 4 <input type="checkbox"/> Smoke (K) |
| 5 <input type="checkbox"/> Fog (F) |
| 6 <input type="checkbox"/> Ice fog (IF) |
| 7 <input type="checkbox"/> Ground fog (GF) |
| 8 <input type="checkbox"/> Blowing spray (BY) |
| 9 <input type="checkbox"/> Blowing dust (BD) |
| 10 <input type="checkbox"/> Blowing snow (BS) |
| 11 <input type="checkbox"/> Blowing sand (BN) |
| A Other |

198 Type of Precipitation

- | |
|--------------------------------------------------------------|
| 1 <input checked="" type="checkbox"/> None (Go to block 200) |
| 2 <input type="checkbox"/> Rain (R) |
| 3 <input type="checkbox"/> Snow (S) |
| 4 <input type="checkbox"/> Hail (A) |
| 5 <input type="checkbox"/> Rain showers (RW) |
| 6 <input type="checkbox"/> Freezing rain (ZR) |
| 7 <input type="checkbox"/> Snow shower (SW) |
| 8 <input type="checkbox"/> Drizzle (L) |
| 9 <input type="checkbox"/> Ice pellets (IP) |
| 10 <input type="checkbox"/> Snow pellets (SP) |
| 11 <input type="checkbox"/> Snow grains (SG) |
| 12 <input type="checkbox"/> Freezing drizzle (ZL) |
| 13 <input type="checkbox"/> Ice crystals (IC) |
| 14 <input type="checkbox"/> Ice pellet shower (IPW) |
| A Other |

199 Intensity of Precipitation

- | |
|-------------------------------------|
| 1 <input type="checkbox"/> Light |
| 2 <input type="checkbox"/> Moderate |
| 3 <input type="checkbox"/> Heavy |
| A Other |

National Transportation Safety Board

**FACTUAL REPORT
AVIATION**

NTSB Accident/Incident Number

ANC 89 IA 099

00 Aircraft Damage

- 1 None
- 2 Minor
- 3 Substantial
- 4 Destroyed

201 Aircraft Fire

- 1 None
- 2 In-flight
- 3 On ground
- A Other

202 Explosion

- 1 None
- 2 In-flight
- 3 On ground
- A Other

203 Damage to Property

- 1 None
- 2 Residence
- 3 Residential area
- 4 Commercial bldg.
- 5 Vehicle(s)

- 6 Airport facility
- 7 Trees
- 8 Crops
- 9 Fence
- 10 Wires/poles
- 11 Other property

04 Injury Index (Most critical injury)

- 1 None
- 2 Minor
- 3 Serious
- 4 Fatal

Injury Summary

Enter only one digit per block

	A Fatal	B Serious	C Minor	D None	E Total
05 First Pilot				/	/
06 Co-pilot					
07 Dual Student					
08 Check Pilot				/	/
09 Flight Engineer					
10 Cabin Attendants					
11 Other Crew					
12 Passengers					
13 TOTAL ABOARD				2	2
14 Other Aircraft					
15 Other Ground					
16 GRAND TOTAL				2	2

217 Classification

- 1 U.S. Registered Aircraft on U.S. Soil, Territories and Possessions, or International Waters
- 2 U.S. Registered Aircraft on Foreign Soil
- 3 U.S. Registered Aircraft operated by a Foreign Operator
- 4 Foreign Registered Aircraft on U.S. Soil, Territories or Possessions
- 5 Military Aircraft
- 6 Aircraft not Registered

20 Part Failure/Malfunction (Multiple entry)

- 1 None
- 2 Part/component #1
- 3 Part/component #2
- 4 Part/component #3
- A Other

221 Incorrect Part (Multiple entry)

- 1 None
- 2 Part/component #1
- 3 Part/component #2
- 4 Part/component #3
- A Other

	A Part/Component #1		B Part/Component #2		C Part/Component #3	
222 Part Name	<i>Stabilator Actuator Trim Screw</i>					
223 ATA Code						
224 Manufacturer	<i>de HAVILLAND</i>					
225 Mfg. Part #	<i>C3-CF-290-9</i>					
226 Mfg. Model #						
227 Serial #						
228 Part Condition						
229 Total Time	<i>4,304</i>					
230 TSO	<i>UNKNOWN</i>					
231 TSI	<i>UNKNOWN</i>					
232 Cycles Total	<i>UNKNOWN</i>					
233 Cycles Since Overhaul	<i>UNKNOWN</i>					
234 Cycles Since Inspection	<i>UNKNOWN</i>					
235 Service Difficulty Report or Malfunction/Defect Report Submitted	1 <input checked="" type="checkbox"/> Yes	2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No
236 Bogus Part	1 <input type="checkbox"/> Yes	2 <input checked="" type="checkbox"/> No	1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No

National Transportation Safety Board

**FACTUAL REPORT
AVIATION**

NTSB Accident/Incident Number

A N C 8 9 J A 0 9 9

Supplement S Aircraft Occupant and Injured Ground Personnel

A Name	B Seat No.	C Address (City & State)	D Crew	E Passenger	F Non-Occupant	G FAA	H Degree of Injury			
							4 Fatal	3 Serious	2 Minor	1 None
<i>Monte Astelli, Tom</i>	<i>1A</i>	<i>Coxhenge, AK</i>		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>
2										
3										
4										
5										
6										
7										
8										
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23										

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440



ANALYSIS REPORT BY SAMPLE for Work Order # 15917
Date Report Printed: AUG 25 89 @ 10:16

Client Sample ID: DARK GREASE
PWSID :UA
Collected @ hrs.
Received AUG 14 89 @ 08:00 hrs.
Preserved with :AS REQUIRED

Client Name : NAT'L TRANSPORTATION SAFETY BO
Client Acct : NATLSSP
P.O.# NONE RECEIVED
Req #
Ordered By : JAMES LABELLE

Analysis Completed :
Laboratory Supervisor :STEPHEN C. IDE
Released By : *[Signature]*

Send Reports to:
1) NAT'L TRANSPORTATION SAFETY BO
2)

Special
Instruct:

Chemlab Ref #: 6992 Lab Smpl ID: 1 Matrix: OIL

Parameter Tested	Result/Units	Method
ROUTINE LOW-METALS	n/a n/a	SOAP
LAB NO.		
DATE SAMPLED.		
DATE REC'D		
LOCATION		
HRS ON OIL		
HRS ON UNIT		
OIL TYPE		
OIL WEIGHT		
METALS (ppm)		
IRON	6100 ppm	SOAP
COPPER	1600 ppm	SOAP
CHROMIUM	51 ppm	SOAP
SILICON	10,600 ppm	SOAP
LEAD	ND(1) ppm	SOAP
SILVER	ND(1) ppm	SOAP
ALUMINUM	33,400 ppm	SOAP
CADMIUM	7900 ppm	SOAP
MAGNESIUM	6200 ppm	SOAP
MANGANESE	250 ppm	SOAP
MOLYBDENUM	5 ppm	SOAP
NICKEL	11 ppm	SOAP
TIN	ND(1) ppm	SOAP
VANADIUM	3 ppm	SOAP
ZINC	12 ppm	SOAP
BARIUM	8 ppm	SOAP
CALCIUM	924 ppm	SOAP
PHOSPHORUS	490 ppm	SOAP
SODIUM	950 ppm	SOAP
BORON	17 ppm	SOAP

Allowable
Limits

NTSB

SEP 01 1989

ANG DEEGE

75



CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.



5633 B STREET • ANCHORAGE, ALASKA 99518 • TELEPHONE (907) 562-2343

FEDERAL TAX I.D. #92-0040440

Order Date : AUG 17 89
Client Po : NONE RECEIVED
Client Req. #:
Ordered By : JAMES LABELLE

INVOICE 15917

Invoice Date : AUG 21 89
Chemlab Ref #: 6992
Acct #: NATLSSP
Report Printed: AUG 21 89 @ 20:41
SEND REPORT TO:

Bill To: NAT'L TRANSPORTATION SAFETY BO
ACCOUNTS PAYABLE
222 W 7TH AVE BOX 11 RM 142
ANCHORAGE, AK. 99513

222 W 7TH AVE BOX 11 RM 142
ANCHORAGE, AK. 99513

SEND REPORT TO:

Contact Person : JIM LABELLE Phone : XXXXXXXXXX
Shipping Inst. :
Special Inst. :

Sample #	Client Sample Description	Matrix	Parameter Tested	Method	Charge
1	DARK GREASE	OIL	ROUTINE LOW-METALS	SOAP	15.00
2	LIGHT GREASE	OIL	ROUTINE LOW-METALS	SOAP	15.00
				TOTAL DUE	30.00

17



CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440



ANALYSIS REPORT BY SAMPLE for Work Order # 15917

Date Report Printed: AUG 25 89 @ 10:16

Client Sample ID: DARK GREASE
PWSID :UA
Collected @ hrs.
Received AUG 14 89 @ 08:00 hrs.
Preserved with :AS REQUIRED

Client Name : NAT'L TRANSPORTATION SAFETY BO
Client Acct : NATLSBP
P.O.# NONE RECEIVED
Req #
Ordered By : JAMES LABELLE

Analysis Completed :
Laboratory Supervisor :STEPHEN C. EDE
Released By : *[Signature]*

Send Reports to:
1)NAT'L TRANSPORTATION SAFETY BO
2)

Special
Instruct:

Chemlab Ref #: 6992 Lab Smpl ID: 1 Matrix: OIL

Parameter Tested	Result/Units	Method	Allowable Limits
ROUTINE LOM-METALS	n/a n/a	SOAP	
LAB NO.			
DATE SAMPLED			
DATE RCV'D			
LOCATION			
HRS ON OIL			
HRS ON UNIT			
OIL TYPE			
OIL WEIGHT			
METALS (ppm)			
IRON	6100 ppm	SOAP	
COPPER	1600 ppm	SOAP	
CHROMIUM	51 ppm	SOAP	
SILICON	10,600 ppm	SOAP	
LEAD	ND(1) ppm	SOAP	
SILVER	ND(1) ppm	SOAP	
ALUMINUM	33,400 ppm	SOAP	
CADMIUM	7900 ppm	SOAP	
MAGNESIUM	6200 ppm	SOAP	
MANGANESE	250 ppm	SOAP	
MOLYBDENUM	5 ppm	SOAP	
NICKEL	11 ppm	SOAP	
TIN	ND(1) ppm	SOAP	
VANADIUM	3 ppm	SOAP	
ZINC	12 ppm	SOAP	
BARIUM	8 ppm	SOAP	
CALCIUM	924 ppm	SOAP	
PHOSPHORUS	490 ppm	SOAP	
SODIUM	950 ppm	SOAP	
BORON	17 ppm	SOAP	

18



CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343
FEDERAL TAX ID # 92-0040440



ANALYSIS REPORT BY SAMPLE for Work Order # 15917

Date Report Printed: AUG 25 89 @ 10:16

Client Sample ID: DARK GREASE

PWSID :UA

Collected @ hrs.

Received AUG 14 89 @ 08:00 hrs.

Preserved with :AS REQUIRED

Client Name : NAT'L TRANSPORTATION SAFETY BO

Client Acct : NATLSBP

P.O.# NONE RECEIVED

Req #

Ordered By : JAMES LABELLE

Analysis Completed :

Laboratory Supervisor :STEPHEN C. KDE

Released By : *[Signature]*

Send Reports to:

1)NAT'L TRANSPORTATION SAFETY BO

2)

Special

Instruct:

Chemlab Ref #: 6992

Lab Smpl ID: 1

Matrix: OIL

Parameter Tested

Result/Units

Method

Allowable
Limits

Sample SAMPLE COLLECTED BY J.B.

Remarks: ADDITIVE PACKAGE INDICATES THESE ARE (2) DIFFERENT TYPES OF GREASE.

32 Tests Performed

ND- None Detected

NA- Not Analyzed

* See Special Instructions Above

** See Sample Remarks Above

LT-Less Than, GT-Greater Than

UA-Unavailable

76

**GROUP ASSEMBLY PART LIST
PART 2**

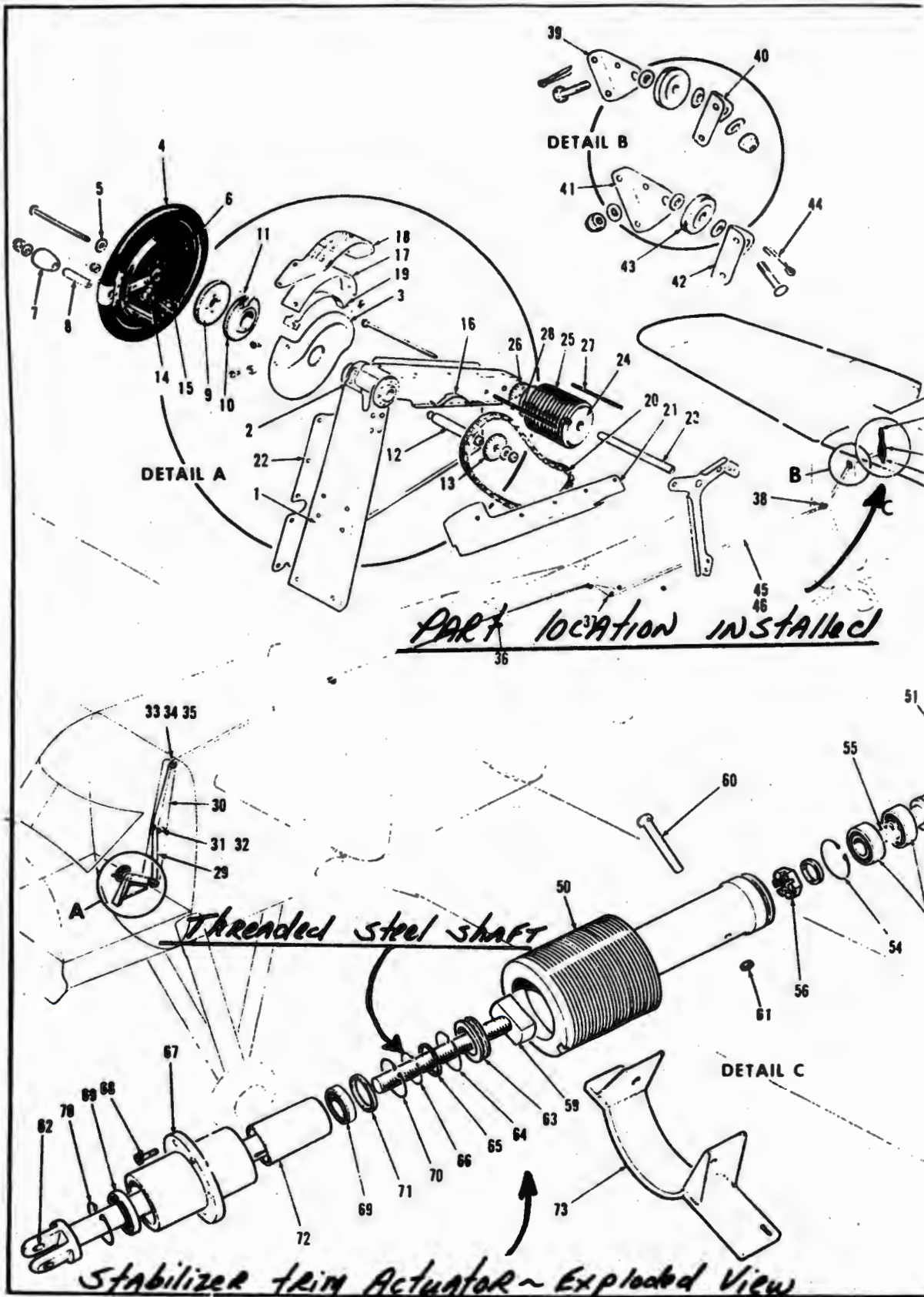


Figure 44 Fuselage - Controls Installation - Elevator Trim

20

STATEMENT OF PARTY REPRESENTATIVES
TO NTSB INVESTIGATION

Aircraft Identification:

Registration Number N41755
Make and Model de Havilland, DHC-3
Location Palmer, Alaska
Date June 20, 1989

The undersigned hereby acknowledge that they are participating in the above-referenced aircraft accident field investigation (including any component tests and teardowns or simulator testing) on behalf of the party indicated adjacent to their name, for the purpose of providing technical assistance to the National Transportation Safety Board.

The undersigned further acknowledge that they have read the attached copy of 49 CFR Part 831 and have familiarized themselves with 49 CFR §831.11, which governs participation in NTSB investigations and agree to abide by the provisions of this regulation.

It is understood that a party representative to an investigation may not be a person who also represents claimants or insurers. The placement of a signature hereon constitutes a representation that participation in this investigation is not on behalf of either claimants or insurers and that, while any information obtained may ultimately be used in litigation, participation is not for the purposes of preparing for litigation.

By placing their signatures hereon all participants agree that they will neither assert nor permit to be asserted on their behalf, any privilege in litigation, with respect to information or documents obtained during the course of and as a result of participation in the NTSB investigation as described above. It is understood, however, that this form is not intended to prevent the undersigned from participating in litigation arising out of the accident referred to above or to require disclosure of the undersigned's communications with counsel.

SIGNATURE

NAME (Printed)

PARTY

DATE

NONE

Continued on reverse

21

Brief of Incident

File No. - 5025

6/20/89

PALMER, AK

A/C Reg. No. N41755

Time (Lcl) - 1345 ADT

-----Basic Information-----

Type Operating Certificate-ON-DEMAND AIR TAXI

Aircraft Damage

NONE

Fatal

Injuries

Serious

Minor

None

Type of Operation -BUSINESS

Fire

Crew

0

0

0

2

Flight Conducted Under -14 CFR 91

NONE

Pass

0

0

0

0

Incident Occurred During -APPROACH

-----Aircraft Information-----

Make/Model - DE HAVILLAND DHC-3

Eng Make/Model - P&W R-1340

ELT Installed/Activated - YES/NO

Landing Gear - TAILWHEEL-ALL FIXED

Number Engines - 1

Stall Warning System - YES

Max Gross Wt - 8000

Engine Type - RECIPROCATING-CARBURETOR

No. of Seats - 9

Rated Power - 600 HP

-----Environment/Operations Information-----

Weather Data

Wx Briefing - NO RECORD OF BRIEFING

Itinerary

Last Departure Point

Airport Proximity

OFF AIRPORT/STRIP

Method - N/A

SAME AS ACC/INC

Completeness - N/A

Destination

Airport Data

Basic Weather - VMC

LOCAL

PALMER

Wind Dir/Speed- CALM

Visibility - 100.0 SM

ATC/Airspace

Runway Ident - N/A

Lowest Sky/Clouds - 8000 FT SCATTERED

Type of Flight Plan - COMPANY (VFR)

Runway Lth/Wid - N/A

Lowest Ceiling - NONE

Type of Clearance - NONE

Runway Surface - N/A

Obstructions to Vision- NONE

Type Apch/Lndg - TRAFFIC PATTERN

Runway Status - N/A

Precipitation - NONE

Condition of Light - DAYLIGHT

-----Personnel Information-----

Pilot-In-Command

Age - UNK/NR

Medical Certificate -

Certificate(s)/Rating(s)

Biennial Flight Review

Flight Time (Hours)

COMMERCIAL

Current - UNK/NR

Total - UNK/NR

Last 24 Hrs - UNK/NR

SE LAND, ME LAND, SE SEA

Months Since - UNK/NR

Make/Model- UNK/NR

Last 30 Days- UNK/NR

Aircraft Type - UNK/NR

Instrument- UNK/NR

Last 90 Days- UNK/NR

Multi-Eng - UNK/NR

Rotorcraft - UNK/NR

Instrument Rating(s) - AIRPLANE

-----Narrative-----

THE AIRPLANE PITCHED ABRUPTLY NOSE DOWN FOLLOWING AN INFLIGHT FAILURE OF THE HORIZONTAL STABILIZER'S TRIM ACTUATOR JACK SCREW. THE CREW WAS ABLE TO MAINTAIN CONTROL OF THE AIRPLANE AND MAKE A SUCCESSFUL LANDING BY EXERTING A LARGE AMOUNT OF BACK PRESSURE ON THE CONTROL WHEEL AND ADDING NEARLY FULL ENGINE POWER. AN EXAMINATION OF THE ACTUATOR REVEALED AN INADEQUATE AMOUNT OF LUBRICATING GREASE AND EXCESSIVE PART WEAR.

Brief of Incident (Continued)

File No. - 5025

11/20/89

PALMER, AK

A/C Reg. No. N41755

Time (Lcl) - 1345 ADT

Occurrence #1 AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation APPROACH

Finding(s)

1. FLT CONTROL SYST, STABILATOR TRIM - FAILURE, TOTAL
 2. MAINTENANCE, LUBRICATION - INADEQUATE - COMPANY MAINTENANCE PSNL
 3. MAINTENANCE, INSPECTION OF AIRCRAFT - INADEQUATE - COMPANY MAINTENANCE PSNL
-

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this incident was:
INADEQUATE LUBRICATION WHICH RESULTED IN THE FAILURE OF THE HORIZONTAL STABILIZER'S TRIM ACTUATOR.

National Transportation Safety Board

PRELIMINARY REPORT AVIATION

2 NTSB Accident/Incident No.

A N C 8 9 I A 0 9 9

3 Investigation By

1 [X] NTSB 2 [] FAA delegated

5 Report Status

1 [] Initial report 2 [X] Preliminary Report

1 [] Accident 2 [X] Incident

4 I.C.A.O. Preliminary Report Submitted (NTSB only)

1 [] Yes 2 [X] No

Location/Date

7 State

AK

8 Zip Code (First 5 Nos.) 99645

9 Date (Nos. for M,D,Y) 6/20/89

10 Local time (24 hour clock) 1345

11 Time Zone ADT

ALMER

Aircraft Information

12 Registration No.

41755

13 Aircraft Manufacturer DE HAVILLAND

14 Model/Serial No.

DHC-3

Type of Aircraft

[X] Airplane 3 [] Glider 5 [] Blimp/Dirigible 7 [] Gyroplane Helicopter 4 [] Balloon 6 [] Ultralight A Specify

16 Home Built

1 [] Yes 2 [X] No

Other Aircraft-Collision Between Aircraft

17 Registration No.

18 Aircraft Manufacturer

19 Model/Serial No.

Accident Information

20 Aircraft Damage

[X] None [] Minor [] Substantial [] Destroyed

21 Property Damage (Multiple entry)

1 [X] None 2 [] Residence 3 [] Residential area 4 [] Commercial Bldg. 5 [] Vehicle 6 [] Airport Facility 7 [] Trees 8 [] Crops 9 [] Wires, Poles 10 [] Other property

22 Accident/Incident Phase of Operation

1 [] Standing 2 [] Taxi 3 [] Takeoff 4 [] Climb 5 [X] Cruise 6 [] Descent 7 [] Approach 8 [] Landing 9 [] Maneuvering 10 [] Hover A Specify

23 Injury Index (Most critical injury)

1 [X] None 2 [] Minor 3 [] Serious 4 [] Fatal

Summary

24 Fatal

25 Serious

26 Minor

27 None

2

Table with columns: Passenger (A Name, B Injury Code), Ground Personnel (A Name, B Injury Code). Includes entries for S, WARREN and MONTERASTELLI, TOM.

Operator Information

40 Operator Name

41 Operator Address (City, State only)

42 Operator Certificate No.

43 Operator Designator Code

44 Doing Business as (dba)

45 Operator Type AIR SERVICE

EOXA

46 Operator Street Address

47 Operator City

PALMER

48 Operator State

AK

49 Operator Zip Code

99645

Types of Certificate(s) Held

50 Carrier Operating Certificate

[] Flag carrier/domestic (121) [] Supplemental [] All cargo (418) 4 [] Large helicopter (127) 5 [] Commuter air carrier 6 [X] On-demand air taxi

51 Operating Certificate

[] Other operator of large aircraft

52 Operator Certificate

1 [] Rotorcraft external load operator (133) 2 [] Agricultural aircraft operator (137)

Regulation Flight Conducted Under

[] 14 CFR 91 (only) 4 [] 14 CFR 105 7 [] 14 CFR 127 10 [] 14 CFR 137 14 CFR 91D 5 [] 14 CFR 121 8 [] 14 CFR 133 11 [] 14 CFR 129 14 CFR 103 6 [] 14 CFR 125 9 [] 14 CFR 135 (Foreign flag) A Specify

PRELIMINARY INFORMATION - SUBJECT TO CHANGE

National Transportation Safety Board

**PRELIMINARY REPORT
AVIATION
ACCIDENT/INCIDENT**

NTSB Accident/Incident Number

A | N | C | 8 | 9 | I | A | 0 | 9 | 9 |

Type of flight Operation conducted

Complete 54, 55, 56, Only if flight was a revenue operation conducted under 121, 125, 127, 129, 135)

<input type="checkbox"/> Scheduled <input type="checkbox"/> Non-scheduled	55	1 <input type="checkbox"/> Domestic 2 <input type="checkbox"/> International	56	1 <input type="checkbox"/> Passenger 2 <input type="checkbox"/> Cargo	3 <input type="checkbox"/> Passenger/cargo 4 <input type="checkbox"/> Mail contract ONLY
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Complete 57 ONLY if 54, 55, 56 not applicable)

<input type="checkbox"/> Personal <input type="checkbox"/> Business <input type="checkbox"/> Instruction (Including air carrier training)	4 <input type="checkbox"/> Executive/corporate	7 <input type="checkbox"/> Other work use	
	5 <input type="checkbox"/> Aerial application	8 <input type="checkbox"/> Public use	10 <input type="checkbox"/> Positioning
	6 <input type="checkbox"/> Aerial observation	9 <input type="checkbox"/> Ferry	A Specify _____

Flight Plan/Itinerary

Flight Plan filed

<input type="checkbox"/> None	2 <input type="checkbox"/> VFR	3 <input type="checkbox"/> IFR	4 <input type="checkbox"/> IFR/VFR	5 <input checked="" type="checkbox"/> Company (VFR)	6 <input type="checkbox"/> Military (VFR)
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60 State	61 Airport I.D.	62 Destination (If "local", mark X here 1 <input checked="" type="checkbox"/>) Nearest city/place	63 State	64 Airport I.D.
65 Same as accident/incident location Nearest city/place A _____		A _____		

Weather Information

69 Visibility (decimals) <u>100.00</u> SM	70 Temperature <u>65</u> Fahr.	71 Dew Point ____ Fahr.	67 Sky/Lowest Cloud Condition		68 Lowest Ceiling		
			1 <input type="checkbox"/> Clear 2 <input checked="" type="checkbox"/> Scattered 3 <input type="checkbox"/> Thin broken 4 <input type="checkbox"/> Thin overcast 5 <input type="checkbox"/> Partial obscuration	1 <input checked="" type="checkbox"/> None 2 <input type="checkbox"/> Broken 3 <input type="checkbox"/> Overcast 4 <input type="checkbox"/> Obscured	A <u>8000</u> Ft. AGL		A _____ Ft. AGL
72 Time of Weather Observation <u>1345</u> (local)			73 Wind Speed ____ Kts.	74 Gusts ____ Kts.	75 Altimeter ____ "Hg	76 Weather Conditions (at accident site) 1 <input checked="" type="checkbox"/> VMC 2 <input type="checkbox"/> IMC	77 Precipitation 1 <input type="checkbox"/> Yes 2 <input checked="" type="checkbox"/> No

Narrative

Brief resume of facts. The information shall not contain opinion, conjecture, or statements reflecting on the character or integrity of the persons involved.)

On June 20, 1989, at approximately 1345 Alaska Daylight Time (a.d.t.), a wheel equipped de Havilland DHC-3 airplane, N41755, sustained an in flight malfunction of the stabilator jack screw. The Commercial Pilot and his sole passenger, an Office of Aircraft Services (OAS) check pilot, were not injured in the incident. The airplane was being operated as a business flight by Woods Air Service in the vicinity of Palmer, Alaska, under 14 CFR Part 91 at the time of the incident. The flight originated in Palmer, Alaska, at 1230 a.d.t. Visual meteorological conditions prevailed, and a company flight plan was filed.

The pilot reported that he was nearing the Palmer

(to continue to next page.)

PRELIMINARY INFORMATION - SUBJECT TO CHANGE

National Transportation Safety Board

**PRELIMINARY REPORT
AVIATION
ACCIDENT/INCIDENT**

NTSB Accident/Incident Number

A | N | C | 8 | 9 | I | A | 0 | 9 | 9 |

narrative (continued)

Airport in preparation for landing, and had just reduced the power and made a slight nose-up rotation of the stabilator trim actuator. Simultaneous with the trim adjustment, a loud bang was heard and the nose quickly pitched down. The pilot, along with the OAS Pilot sitting in the right front seat, both pulled the control wheel backwards against strong resistance to raise the nose. By continuing to exert back pressure and adding nearly maximum power, the two pilots were able to regain a level attitude and make a successful landing at Palmer.

A post flight inspection by Woods Air Service personnel revealed a broken stabilator trim jack screw. The broken part has been removed and is enroute to the Anchorage NTSB Field Office for analysis.

(Attach additional pages if necessary.)

Administrative Data

Notification From FSDO 03	80 Date (Nos. for M, D, Y) 6/20/89	81 Local Time (24 hour clock) 1500	82 Time Zone ADT
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83 District Office/Coordinator	84 Other Federal Agencies Involved In Investigation		
	1 <input type="checkbox"/> FBI	3 <input type="checkbox"/> DEA	5 <input type="checkbox"/> Customs
	2 <input type="checkbox"/> USCG	4 <input type="checkbox"/> DOD	A Specify _____

Investigator(s) Assigned

Investigator-In-Charge S D LA BELLE	86 Form Preparation Date (Nos. for M, D, Y) 6/21/89	87 Form Receipt Date (For NTSB use only)
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Other NTSB Personnel Assigned

D _____	G _____
E _____	H _____
F _____	I _____

PRELIMINARY INFORMATION - SUBJECT TO CHANGE