Aviation Investigation Final Report

Location:	STOVEPIPE WELLS, California	**Accident Number:**	LAX99LA182
Date & Time:	May 11, 1999, 16:30 Local	**Registration:**	N9603J
Aircraft:	Cessna T188C	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot/mechanic who overhauled the accident airplane engine was to remove it from the airplane, located on a highway in a remote desert area, to correct some discrepancies, which had caused the owner's pilot to make a precautionary landing. The mechanic chose to fly the airplane to another state where his shop is located. En route to a fuel source he landed on a road for directions. Subsequently, he arrived at the fuel source and had less than a gallon remaining. His next planned fuel stop was about 75 miles away. In the pilot's written statement he said he remembered noticing the fuel gauges reading low as he was flying low over sand dunes. The engine lost power, he turned on the boost pump, and the engine regained power momentarily. The aircraft then collided with sand dunes in the Death Valley National Park. The pilot reported that there were no mechanical problems with the airplane and he had run it out of fuel. The accident site is about 195 miles from the departure point on a heading about 90 degrees from the pilot's intended course line.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: fuel exhaustion resulting from the pilot becoming lost and disoriented on a cross-country flight.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: CRUISE

Findings
1. (C) FLUID,FUEL - EXHAUSTION
2. (C) BECAME LOST/DISORIENTED - INADVERTENT - PILOT IN COMMAND

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #3: NOSE OVER
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
3. TERRAIN CONDITION - SOFT

Factual Information

HISTORY OF FLIGHT

On May 11, 1999, about 1630 hours Pacific daylight time, a Cessna T188C, N9603J, operated by the pilot was substantially damaged during an off-airport landing at Stovepipe Wells, Death Valley National Park, California. The commercial pilot received serious injuries. Visual meteorological conditions prevailed for the personal flight operated under the provisions of 14 CFR Part 91 and no flight plan was filed. The flight originated at Overton, Nevada, about 1430, and was destined for a fuel stop in Jean, Nevada, with an ultimate destination of Corona, California.

An operator in Carson City, Nevada had recently sold the aircraft to an agricultural operator located in Alabama. The buyer sent a ferry pilot to reposition the aircraft to Alabama. The engine had about 2.5 hours since overhaul, which according to the engine logbook, was done February 28, 1996.

About 30 minutes into the flight, the ferry pilot experienced high oil temperature and made a precautionary landing at Yerington, Nevada. The seller was contacted at Carson City and came to Yerington and replaced the Vernitherm oil temperature sensor and checked the oil cooler for restrictions. The ferry pilot performed a satisfactory flight check and departed for Tonopah, Nevada, for a fuel stop.

After departure from Tonopah and en route to the next fuel stop, the ferry pilot experienced a loss of engine oil pressure with an increase in temperature and engine roughness. He landed at Alamo, Nevada. The seller was again contacted for assistance, and replaced the oil pressure bypass valve, changed the oil and filter, and inspected the engine. The ferry pilot departed Alamo southbound following Highway 93 and again experienced a loss of oil pressure. He landed on Highway 93, about 100 miles north of Las Vegas, Nevada.

Again the seller was contacted, and, unable to resolve the oil pressure issue, he suggested contacting the engine shop that overhauled it. The ferry pilot left the aircraft parked on Highway 93 and returned to Alabama. About 2 days later, the engine shop owner (accident pilot) flew the aircraft to Overton for fuel. Prior to reaching Overton, the pilot landed on a road at Moapa for directions. The airplane arrived at Overton about 1026, and was refueled with 53.3 gallons. According to a placard on the instrument panel, the airplane has 52 usable gallons of fuel from the 54-gallon tank system.

The manager of the refueling facility stated that after he fueled the airplane the pilot flew the airplane around the pattern for a test flight. Then with a friend helping, the pilot pulled the engine cowling off and appeared to be working on it. They left the airport for some time in the

friend's pickup truck. The airport manager left the airport for some errands and when he returned, about 1500, the plane and pilot were gone.

According to the pilot, his intended destination after departing Overton was Jean. After departing Overton, he stated that he flew the airplane hard in the vicinity of the airport to check temperatures and oil pressure. He then planned a route to Corona with fuel stops as necessary. He had no explanation as to how he arrived at Stovepipe Wells. In his written statement, he said he remembered seeing the fuel gauges reading very low as he was flying low over some sand dunes. He also recalled the engine losing power and his turning on the boost pump, which momentarily restored power. The airplane contacted the sand dunes and nosed over. In his written report, the pilot stated that there were no mechanical problems with the airplane. He stated verbally to the Safety Board that the airplane had run out of fuel.

The straight-line distance from Overton to Jean is about 75 miles, and from Overton to Stovepipe Wells it is about 195 miles on a heading 90 degrees from the course line between Overton and Jean.

Examination of the logbooks and the recording tachometer by the Safety Board revealed 10.9 hours had accrued since the overhaul at the time of the accident. According to the seller, the shop owner was to remove the engine and transport it to Santa Ana, California, for examination and repairs, and the seller was to pick the engine up and reinstall it.

PERSONNEL INFORMATION

According to the Federal Aviation Administration (FAA) Airman and Medical Records, the pilot held a commercial pilot certificate with ratings for single engine land, multiengine land and instruments. In his written report to the Safety Board, the pilot reported a total flight time of 1,625 hours, with 62 flown in the preceding 90 days. The last FAA medical certificate of record was a second-class issued on June 28, 1995.

AIRCRAFT INFORMATION

According to aircraft logbook information the last documented annual inspection occurred on December 10, 1998, at 318.3 recording tachometer hours. The inspection documented the replacement of the right wing with a repaired wing.

The engine logbook documented a major overhaul dated February 28, 1996, at 2,260.7 total hours and zero hours since major overhaul. At the December 10, 1998 annual inspection, the total time was 2,261.2 hours and 318.3 tachometer hours. According to the records, the engine had accrued about 10.9 hours since the February 28, 1996 major overhaul.

TESTS AND RESEARCH INFORMATION

The oil pressure, oil temperature, cylinder head temperature, and fuel gauges were removed

and taken to an FAA approved repair station for functional testing and examination.

The oil pressure gauge was properly calibrated and range marked.

A marine type water temperature gauge was installed in the instrument panel and marked as oil temperature. The gauge was calibrated in both Fahrenheit and Centigrade. It was not range marked, and on the glass face of the instrument was found the word "OIL" taped over the instrument face marking "water temp." The gauge was wired to a Rochester probe installed in an engine oil galley. Detailed examination of the wire from the gauge to the probe revealed that it was made up of three wires spliced together to form the necessary length; a yellow wire was spliced to a red wire then spliced to a black wire with a wire nut to reach the probe. The black portion of the wire was routed over the No. 5 engine cylinder push tube seal retainer springs. At that point, the wire was found severed and had the appearance of chafing or wearing at the spring area. Testing revealed that grounding of the wire would cause a full high needle deflection and breaking it without grounding would cause a full low needle deflection.

Testing of the gauge and probe combination revealed higher indicated temperatures than actual temperatures. The actual temperature of 160 degrees Fahrenheit indicated 192 degrees Fahrenheit, and 280 degrees Fahrenheit indicated 290.

The cylinder head temperature gauge was in calibration and without range marking. Embossed on the back of the instrument case it states use 2-OHM C.C. leads (copper/constantan). The installation leads used on the aircraft were found to be iron and constantan (I.C.). Functional testing with C.C. leads revealed indicated temperatures 10-degrees low over their entire range of readings. With I.C. leads, 100 degrees Centigrade indicated 120 degrees Centigrade, and 300 degrees Centigrade indicated 350 degrees centigrade.

The fuel quantity transmitters and gauges were removed as pairs and functionally tested. There were no manufacturer recommended test procedures available. The gauges and transmitters were tested using normal shop procedures. Each pair functioned normally.

After a postaccident examination of the engine, it was shipped to Teledyne Continental Motors in Mobile, Alabama. The engine was installed in a test cell and functionally test run in accordance with a normal engine acceptance test run procedure. Running it during the test was necessary to make some operational adjustments. Subsequently, the engine produced maximum certificated power. Details of the engine test run are included in this report.

ADDITIONAL INFORMATION

The airplane was released to the owner on September 23, 1999.

Pilot Information

Certificate:	Commercial	**Age:**	52,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Center
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 2 Expired	**Last FAA Medical Exam:**	June 28, 1995
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1625 hours (Total, all aircraft), 1545 hours (Pilot In Command, all aircraft), 62 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N9603J
Model/Series:	T188C T188C	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	T18803826T
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	December 10, 1998 Annual	**Certified Max Gross Wt.:**	4400 lbs
Time Since Last Inspection:	10 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2291 Hrs	**Engine Manufacturer:**	Continental
ELT:		**Engine Model/Series:**	TSIO-520-T
Registered Owner:	CHISENHALL AG SERVICE, INC.	**Rated Power:**	310 Horsepower
Operator:	RICHARD G. SNOVER	**Operating Certificate(s) Held:**	None
Operator Does Business As:	ONE STOP AVIATION, INC.	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	20 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	32°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	OVERTON , NV (0L9)	**Type of Flight Plan Filed:**	None
Destination:	JEAN , NV (0L7)	**Type of Clearance:**	None
Departure Time:	14:30 Local	**Type of Airspace:**	Class E

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	Soft
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	36.599277,-116.829856(est)

Administrative Information

Investigator In Charge (IIC):	Petterson, George
Additional Participating Persons:	NICK HARRINGTON; LAS VEGAS , NV MIKE J GRIMES; MOBILE , AL HENRY J SODERLUND; WICHITA , KS
Original Publish Date:	November 30, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=46322