



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	N. Miami Beach, FL	<b>Accident Number:</b>	MIA05FA040
<b>Date &amp; Time:</b>	12/04/2004, 0851 EST	<b>Registration:</b>	N41626
<b>Aircraft:</b>	Convair Div. of Gen. Dynamics 340	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Part 125: 20+ Pax,6000+ lbs		

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## Analysis

The pilot stated that when the airplane was 3 miles east of the shoreline, at 3,000 feet, he felt a short tremor in the left engine followed by loss of power from the left engine. The pilot elected to return to the departure airport while declaring an emergency to air traffic control. During the process of securing the left engine the pilot noticed the propeller did not feathered and the airplane was descending quickly. He maneuvered the airplane and ditched in a lake. On September 26, 2003 engine s/n: 34592 was removed from the accident airplane due to high oil consumption with 1,225 hours of time in service. It was reportedly preserved and stored at the operator's warehouse. The mechanic who reportedly preserved the engine stated he followed the steps in the manual that was provided by the operator. On October 27, 2004 the left engine, s/n: NK510332, which was producing metal for months, was removed and engine s/n: 34592 was taken out of preservation and installed in the left position on the accident airplane with a new overhauled propeller assembly. On November 06, 2004, the left engine's, s/n: 34592, propeller governor was replaced due to the left propeller slow to response to power setting. During the post accident engine examination, the engine's main oil screen was observed with deposits of metal flakes and fragments, the oil scavenge pump would not rotate and had deposits of metal fragments internally; the engine was seized and would not rotate. Catastrophic damage was observed to the accessories drive gears, oil transfer tube, and protection covers in the front accessory area. It was observed during a visual inspection of the crankshaft and bearings, including the front journal and front crankpin had damaged and sections of their respective bearings missing. The master rod bearing had incurred a catastrophic failure. Several cylinders skirts were found with impact marks from piston rods. Before removing the propeller assembly from the engine, the propeller feather system was flush with fresh oil and pressured with a feathering pump; the propeller blades were observed moving toward the feather position. Examination of the propeller assembly revealed metal contamination throughout the system; the propeller's governor screen gasket was clogged with metal contamination. The maintenance manual provided by the operator used for the engine preservation details several tasks required to be accomplished to the engine for proper engine preservation (i.e. thrust bear, cylinder, and propeller shaft treatments), which the mechanic did not mention he performed. No documentation for inspection and condition status of the dehydrator plugs were available. Documentation for flushing of contamination from the metal

producing engine, s/n NK510332, was not available nor knowledge by the operator if since a process was performed to the left engine's oil tank and its system before installation of engine s/n: 34592. An FAA review of the cargo manifest discovered two different manifest weights. The cargo manifest obtained at the accident scene showed a total of 267 pieces of cargo annotated at a total weight of 10, 837 lbs. The sealed cargo manifest package showed a total of 267 pieces of cargo annotated at a total weight of 14,182 lbs. The maximum payload weight for the accident airplane is 13,586 lbs.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The improper maintenance of the left engine by company maintenance personnel (failure to flush metal from the oil system and failure to properly preserve the engine for storage) resulting in a total failure of the master rod bearing and contamination of the engine oil system with metal, which prevented the left propeller from feathering. This resulted in the airplane being unable to maintain altitude following loss of engine power and subsequent ditching in a lake. A factor in this accident is the aircraft operator and flight crew exceeding the maximum allowable takeoff weight for the airplane.

## Findings

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Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF  
Phase of Operation: CLIMB - TO CRUISE

### Findings

1. (C) MAINTENANCE,SERVICE OF AIRCRAFT/EQUIPMENT - IMPROPER - COMPANY MAINTENANCE PERSONNEL
2. ENGINE ASSEMBLY,BEARING - FAILURE,TOTAL
3. LUBRICATING SYSTEM,OIL PORT/PASSAGE,INTERNAL - CONTAMINATION,OTHER THAN WATER
4. PROPELLER FEATHERING - NOT POSSIBLE - PILOT IN COMMAND
5. ALTITUDE - NOT POSSIBLE - PILOT IN COMMAND
6. (F) AIRCRAFT WEIGHT AND BALANCE - EXCEEDED - COMPANY/OPERATOR MANAGEMENT

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Occurrence #2: DITCHING  
Phase of Operation: LANDING - FLARE/TOUCHDOWN

## Factual Information

### History of Flight

On December 4, 2004, about 0851 eastern standard time, a Convair 340, N41626, registered to and operated by Miami Air Lease, a Title 14 CFR Part 125 certificate holder, ditched in Maule Lake, North Miami Beach, Florida, following loss of power from the number one engine, while carrying cargo for a Title 14 CFR Part 135 cargo operator, from Opa Locka Airport, Opa Locka, Florida, to Nassau, Bahamas. Visual meteorological conditions prevailed at the time and an instrument flight rules flight plan was filed. The commercial-rate pilot and the airline transport-rated copilot were not injured. The airplane incurred substantial damage. The flight originated from Opa Locka, the same day, about 0840.

The pilot stated that the departure from Opa Locka and climb to 3,000 feet were uneventful. When 3 miles east of the shoreline, at 3,000 feet, he felt a short tremor in the left engine. He scanned the engine's instruments and all "seemed perfect". Right after the scan, the tremor returned, followed by loss of power from the left engine. The pilot elected to return to the departure airport while declaring an emergency to air traffic control (ATC). He and the copilot initiated emergency procedures; at that time, the pilot noticed the propeller on the left engine would not go to the feathered position. Upon completion of the emergency checklist the aircraft's altimeter was indicating 1,200 feet and the airplane was descending quickly. Realizing he was not going to reach the airport, he advised ATC and saw Maule Lake to the right of airplane. He maneuvered the airplane from a west to an east heading toward the lake. Before ditching the airplane in the lake, it passed over power lines and clipped trees.

### Personnel Information

The pilot-in-command who was seated in the left seat was the holder of a commercial pilot certificate with ratings for airplane multi-engine land, instrument airplane, CV-220, CV-340, CV-440 and private privileges airplane single-engine land. He was issued a first class medical certificate on December 18, 2003, with no limitation. Pilot's flight times as documented with operator's personnel records consisted of 3,100 hours total time in all aircraft, 2,098 of those hours as pilot-in-command, and 2,400 hours in the accident airplane make and model. In the prior 90 days before the accident he had flown 78 hours and in the prior 30 days he had flown 31 hours.

The copilot who was seated in the right seat was the holder of an airline transport pilot certificate with ratings for airplane multi-engine land and commercial privileges airplane single-engine land, rotorcraft-helicopter. Copilot's flight times as documented with operator's personnel records consisted of 9,169 hours total time in all aircraft, 3,823 hours as pilot in command, and 964 hours in the accident airplane make and model. In the prior 90 days before the accident he had flown 54 hours and in the prior 30 days he had flown 29 hours.

### Aircraft Information

FAA records indicate the accident airplane was manufactured in 1955 as a military C-131B, serial number (s/n) 53-7822. In 1992 an FAA airworthiness certificate was issued changing the model and serial number of the airplane to a Convair 340-70, s/n 274, registration number N41626, in the transport category. The airplane was registered to Miami Air Lease in December of 1993. The airplane was equipped with two Pratt & Whitney (P&W) R2800-103W engines and two Hamilton Standard model MD 43E60/6895A propellers.

According to the Miami Air Lease Incorporated FAA approved Airplane Maintenance Program and records, the accident airplane was on a continuous airworthiness maintenance program. The last inspection was a continuous airworthiness inspection "A" on November 27, 2004, at total airframe time of 18,465 hours, which was accomplished 8 hours before the accident flight. The last unscheduled maintenance was performed on December 02, 2004, to the left engine s/n: 34592; the number two cylinder was replaced, at total airframe time of 18,470 hours.

The operator's maintenance records for the left engine, s/n: 34592, indicated the engine was overhauled on March 3, 1998 and installed on the accident airplane. In May of 1998 the engine was removed due to high oil consumption and repaired at the same facility which performed the overhaul; thereafter installed on the accident airplane. In November of 1999 the engine had the blower assembly repaired by the overhaul facility. The engine was installed in the right engine position of the accident airplane with 809 hours total time in service, on August 31, 2002. No documentation for the engine's activity was available between those two dates. On September 26, 2003 the engine was removed, from the right position of N41626, due to high oil consumption and document as "for company convenience" with a total time in service of 1225 hours. Immediately following the removal the engine was reportedly preserved and taken to the operator's warehouse for storage.

The mechanic who preserved the left engine stated that he had done previous maintenance work for operator and was asked if he would prepared an engine for preservation for them. The operator explained they picked up a new route and wanted a low time engine on the airplane to replace the high time engine that was on the airplane. He consulted with an employee at the facility where he worked to see if the same corrosion inhibitor oil was still being used to preserve engines. The maintenance manual for the engine preservation was provided by the operator along with the special hydro spark plugs, which appeared to be new and unused. The mechanic purchased and supplied the corrosion inhibitor oil. He noted the engine, s/n: 34592, that was removed had noticeable oil leaks and appeared to be leaking for sometime. The mechanic stated he followed the steps as outlined in the manual. He first drained the existing oil from the engine. He premixed new engine oil with corrosion inhibitor and pumped into the engine oil system under pressure. Five to 8 gals of mixed oil was pumped into the engine before it flowed out from the nose dome section of the engine. He removed the spark plugs from all the cylinders and replaced them with the hydro plugs. The engine was then covered with plastic and taken to the Miami Air Lease warehouse. The operator did not indicate how long the engine was going to be kept in storage. The mechanic went to the operator's warehouse to document the preservation in the engine's logbook. The engine's logbook was locked in a cabinet and the person with the key was out of town. The mechanic documented the engine preservation on the back of the airplane's flight log sheet dated September 26, 2003, which documented the removal and installation of that right engine.

A spectrometric engine oil analysis report dated July 2, 2004 for the left engine, s/n: NK510332, indicated the oil contained metal. On October 27, 2004 the left engine, s/n: NK510332, was removed and engine s/n: 34592 was taken out of storage and installed in the left position of the accident airplane. No documentation was available on what depreservation procedures were performed to the engine prior to installation. A newly overhauled propeller assembly, s/n: AP7274, was installed on the engine during the installation. During the engine performance check run, oil leaks were found and corrected as document in the engine's logbooks. On November 06, 2004, the left engine's propeller governor was replaced due to left propeller slow to response to power setting and propeller governor, s/n: WH97748 was

installed.

#### Weight & Balance

The FAA reviewed the cargo manifest and weight and balance sheet for the accident flight. The cargo manifest obtained at the accident scene showed the owner of the cargo as Miami Air Lease, Inc., port of lading Miami International Airport and port of unloading Nassau International Airport, dated December 4, 2004. A total of 267 pieces of cargo was annotated at a total weight of 10,837 lbs. The weight of 10,839lbs, which was scratched out to represent a weight of 10,459 lbs, was used for weight and balance calculations. The co-pilot reported after the accident that he removed some cargo pallets prior to the flight. As per the copilot, the pallets have a weight of 45 lbs each and ten pallets were removed for a total weight of 450 lbs. The sealed cargo document package for the accident flight contained an air cargo manifest listing the owner of the cargo as Mario's Air Inc. and a total of 267 pieces of cargo at a total weight of 14,182 lbs.

Calculation of the takeoff weight of the airplane by NTSB showed that using the basic operating weight of the airplane of 31,414 lbs., and adding the cargo weight of 14,182 lbs., the zero fuel weight was 45,596 lbs. The maximum allowable zero fuel weight for the airplane is 45,000. Adding the reported fuel load of 4,800 pound to the 45,596 zero fuel weight results in a takeoff weight of 50,396. The maximum allowable takeoff gross weight for the airplane is 47,000 lbs.

#### Meteorological Information

A METAR weather observation taken at the Opa Locka Airport at 0853, indicates that the wind was from 350 degrees at 6 knots, visibility 10 statute miles, few clouds at 4,200, temperature and dew point were 66 and 57 degrees Fahrenheit, respectively, altimeter setting 30.13 in Hg.

#### Communications

The crew of the accident airplane was in communication with the FAA Opa Locka Tower up to and just after departure and was transferred to the FAA Miami Approach Control. Communications remained with Miami Approach Control until impact with water. The accident airplane was not equipped with a cockpit voice recorder or a flight data recording device.

#### Wreckage and Impact Information

The airplane came to rest at location 27 degrees 10.98 minutes north latitude and 80 degrees 12.72 minutes west longitude, in about 14 feet of water. The initial impact of the airplane in the water was tail first in a nose high attitude. When the nose section of the airplane contacted the water, the right engine's propeller and propeller hub assembly separated from the front section of the engine. The airplane yawed to the left as it skidded in the water and came to a stop on a heading of 350 degrees. The left engine's propeller blades were found in a low pitch position. One of the blades on the left engine's propeller assembly was damaged during the recovery process, forcing the blade in a reverse pitch position.

The airplane remained intact. The metal skin located at the lower aft section of the empennage was separated and torn away from the deformed ribs and stringers of the airplane's structure. The right engine incurred damage at the propeller gear box and the propeller was missing. The right engine's propeller was later recovered by the salvage crew near where the airplane initially ditched in the water. No external damage was noted to the number one engine and propeller. The number one engine nacelle, left wing, left horizontal stabilizer, and elevator were found

with deposits of engine oil over the surfaces. Examination of the airplane upon recovery revealed all flight controls surface were present and continuity was established. No evidence of any pre-impact mechanical discrepancies with the airframe was found that would have prevented normal operation of airplane. The left engine with the propeller assembly, attached, was removed from the airplane for further examination.

At the time of airplane recovery the left engine's propeller feathering pump was tested on the airplane under NTSB oversight. The supply hose leading to the engine's propeller governor was removed at the engine nacelle firewall and electrical power was applied directly to the pump. The feathering pump pumped several quarts of oil with visible pressure.

Examination of the left engine s/n: 34592 and the removal of the propeller assembly s/n: AP7274 was conducted under FAA and NTSB oversight. Before removing the left engine's propeller hub assembly, a feather pump was connected to the supply hose to the propeller governor on engine s/n 34592. The pump was operated supplying fresh oil under pressure to the propeller governor's direct propeller feathering port. No movement of the blade's pitch was noted. Oil was observed leaking from in-between the propeller governor and the attaching surface on the engine. The propeller hub dome was removed. A noticeable amount of mixture of dark oil and water drained from the assembly. An examination of the blade's drive gears indicated the blades were in a low pitch position. The feathering pump was operated with the hub dome assembly removed. No oil was observed coming from the propeller hub dome shaft. The supply line was disconnected from the propeller governor and the feathering pump was operated. Fresh oil was observed coming out from the supply hose under visual pressure. The supply hose was re-connected to the prop governor feather port and the feathering pump was operated. After a several seconds of operation fresh oil was observed coming out in a steady stream after the contaminated fluid was purged from the propeller hub dome shaft. The propeller hub assembly was re-installed and the feathering pump was operated again. After several seconds the blades were observed traveling toward the feather position, while the damaged blade in the reverse position traveled toward a low pitch position. The propeller hub assembly and the Hamilton propeller governor part number 5U18-62, s/n WH 97748, were removed for further teardown examination. The screened gasket between the propeller governor and the engine was found with metal flakes and particles on the propeller governor side of the screen.

The engine's main oil screen was removed and deposits of metal flakes and fragments were found. The oil scavenge pump would not rotate installed on the engine. The oil scavenge pump was removed, deposits of metal fragments were found internally. The engine was seized and would not rotate. The front accessory section of the engine was removed. Catastrophic damage was observed throughout the accessories drive gears, oil transfer tube, protection covers, and securing bolts. The number eight cylinder was removed for a visual inspection of the crankshaft and bearing condition. The front journal and front crankpin were found damaged and sections of their respective bearings were missing. The master rod bearing had incurred a catastrophic failure. Several cylinders skirts were found with impact marks from piston rods.

The propeller assembly s/n: AP 7274 and the Hamilton propeller governor, s/n WH 97748, were examined during a tear down inspection under NTSB oversight. The piston housing in the dome of the propeller hub assembly had deposit of metal flakes internally. The retaining pins were found sheared on the number three blade pitch gear. The number three blade was the blade damaged during the airplane recovery process. Dirt and metal deposit were found on the

inside side of the propeller governor's gasket screen. A functional bench check was performed to the propeller feathering cut off switch with unremarkable results. No pre-accident discrepancies during the examination of the propeller assembly and propeller governor were observed.

#### Test and Research

The maintenance manual provided by the operator used for the engine preservation states "The corrosion preventive mixture used for the preservation of the inactive engines and mentioned throughout the following instruction is composed of a blend of three parts engine lubricating oil and one part corrosion preventive compound, Rust Ban 626, 628, or 631. Heating the corrosion preventive mixture to a temperature of 38 to 104 degrees Celsius is permissible to facilitate application." The manual details several tasks required to be accomplished to the engine for proper engine preservation (i.e. thrust bear, cylinder treatment, propeller shaft...) Inspection of dehydrator plug must be inspected every seven days and verified for safe or unsafe humidity conditions.

#### Additional Information

The wreckage excluding the left engine and propeller, and cargo was released to the owner's representative on December 13, 2004. All retained cargo was released to Miami Air Lease on December 17, 2004. The number one engine was released to Miami Air Lease on December 23, 2004. The propeller was released to Miami Air Lease on January 5, 2005.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	28, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Without Waivers/Limitations	<b>Last FAA Medical Exam:</b>	12/01/2004
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	11/01/2004
<b>Flight Time:</b>	3100 hours (Total, all aircraft), 2400 hours (Total, this make and model), 2098 hours (Pilot In Command, all aircraft), 78 hours (Last 90 days, all aircraft), 31 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

## Co-Pilot Information

<b>Certificate:</b>	Airline Transport	<b>Age:</b>	51, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane Single-engine; Instrument Airplane	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 With Waivers/Limitations	<b>Last FAA Medical Exam:</b>	10/01/2004
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	03/01/2004
<b>Flight Time:</b>	9169 hours (Total, all aircraft), 964 hours (Total, this make and model), 3823 hours (Pilot In Command, all aircraft), 53 hours (Last 90 days, all aircraft), 28 hours (Last 30 days, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Convair Div. of Gen. Dynamics	<b>Registration:</b>	N41626
<b>Model/Series:</b>	340	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Transport	<b>Serial Number:</b>	274
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	3
<b>Date/Type of Last Inspection:</b>	11/01/2004, Continuous Airworthiness	<b>Certified Max Gross Wt.:</b>	47000 lbs
<b>Time Since Last Inspection:</b>	6.2 Hours	<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	18465 Hours at time of accident	<b>Engine Manufacturer:</b>	Pratt & Whitney
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	2800
<b>Registered Owner:</b>	Miami Air Lease	<b>Rated Power:</b>	2400 hp
<b>Operator:</b>	Miami Air Lease	<b>Operating Certificate(s) Held:</b>	None
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	MIAB

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual Conditions	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	OPF, 9 ft msl	<b>Distance from Accident Site:</b>	8 Nautical Miles
<b>Observation Time:</b>	0853 EDT	<b>Direction from Accident Site:</b>	80°
<b>Lowest Cloud Condition:</b>	Few / 4200 ft agl	<b>Visibility</b>	10 Miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	6 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	350°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.13 inches Hg	<b>Temperature/Dew Point:</b>	19° C / 14° C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Opa Locka, FL (KOPF)	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Nassau (MYNN)	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	0840 EST	<b>Type of Airspace:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	N/A	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 None	<b>Latitude, Longitude:</b>	25.933889, -80.150278

## Administrative Information

**Investigator In Charge (IIC):** Jose L Obregon **Report Date:** 04/25/2006

**Additional Participating Persons:** Samuel Perry; Miami FSDO -21

**Publish Date:**

**Investigation Docket:** NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at [pubinq@ntsb.gov](mailto:pubinq@ntsb.gov), or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).