

FSI# A0826450

BAHAMAS FLIGHT STANDARDS INSPECTORATE

NASSAU, N. P., BAHAMAS

AIRCRAFT ACCIDENT REPORT

**LANDING GEAR FAILURE
FAIRCHILD SA-227AC, C6-SAR
LYNDEN PINDLING INT'L AIRPORT
FEBRUARY 02, 2008**



Flight Standards Inspectorate Bahamas Department of Civil Aviation

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March 31, 2008

Mr. Cyril Saunders
Director
Civil Aviation Department
Seaban House
Crawford Street, Oakes Field
P.O. Box N-975
Nassau, N.P.,
Bahamas

Sir

The attached report summarizes the investigation into the circumstances of the accident involving C6-SAR, a Fairchild SA-227AC, registered in the Bahamas to Western Air Limited. This accident occurred at 17:04 local time at Lynden Pindling International Airport, Nassau, Bahamas on Runway 09, February 02, 2008.

This report is submitted pursuant to Part XII, Regulation 80, and Schedule 19 of the Bahamas Civil Aviation (Safety) Regulation (CASR 2001) and in accordance with Annex 13 to the Convention on International Civil Aviation Organization (ICAO), Ninth Edition July 2001.

In accordance with Annex 13 to the Convention on International Civil Aviation (ICAO), and Schedule 19 of the Bahamas Civil Aviation (Safety) Regulations (CASR April 17, 2001), the fundamental purpose of such investigations is to determine the circumstances and causes of these events, with a view to the preservation of life and the avoidance of similar occurrences in the future. It is not the purpose of such investigations to apportion blame or liability.

This information is published to inform the aviation industry and the public of the circumstances surrounding this accident. The contents of this Report may be subjected to alterations or corrections if additional information becomes available.

Philip C. Romer
Investigator in Charge
Flight Standards Inspectorate
Bahamas Department of Civil Aviation



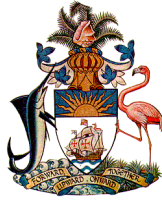
Participants in the Investigation

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**Flight Standards Inspectorate
Flight Standards Inspectorate
Flight Standards Inspectorate**

**IIC
Operations
Airworthiness**





FLIGHT STANDARDS INSPECTORATE
BAHAMAS CIVIL AVIATION DEPARTMENT

AIRCRAFT ACCIDENT
REPORT No. A0826450

SYNOPSIS

Operator: Western Air Limited

Manufacturer: Fairchild Aircraft Corporation

Model: SA-227AC

Registration: C6-SAR

Place of Accident: Lynden Pindling International Airport
Nassau, Bahamas

Date of Accident: February 02, 2008

Investigating Authority: Flight Standards Inspectorate

Investigator in Charge: Philip C. Romer

Notification: Director of Civil Aviation
M7 Aerospace (Manufacturer of Aircraft)

Releasing Authority: Flight Standards Inspectorate

Date of Report: March 31, 2008



ABBREVIATIONS and TERMINOLOGY

ADDS	Aviation Digital Data Service - Report by Meteorological Department
AIS	Automatic Information Services
ATS	Air Traffic Services
BDCA	Bahamas Department of Civil Aviation
CASR	Bahamas Civil Aviation (Safety) Regulations (April 17, 2001)
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CG	Center of Gravity
CVR	Cockpit Voice Recorder
DCA	Director of Civil Aviation
DFDR	Digital Flight Data Recorder
DOO	Director of Operations
DRTL	Disaster Response Team Leader
DS	Director of Safety
CAD	Civil Aviation Department
EST	Eastern Standard Time (-5 hours (-4DT) to convert from UTC)
ERM	Emergency Response Manual
FAA	Federal Aviation Administration
FSI	Flight Standards Inspectorate
FSS	Flight Service Station
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Condition
LH MLG	Left Hand Main Landing Gear
MALSF	Medium-intensity Approach Lighting System (with sequenced flashers)
MD	Manager of Dispatch
MCM	Maintenance Control Manual
MET	Meteorological Office / Department
METAR	Weather Report furnished by Meteorological Department
MIRL	Medium Intensity Runway Lights
MYEH	ICAO Airport Designation – Governors Harbour
NDB	Non-directional Beacon
NM or nm	Nautical Miles
NTSB	National Transportation Safety Board
PAPI	Precision Approach Path Indicator
RCA	Root Cause Analysis
SEP	Survival and Emergency Procedures Training
T/L	Technical Log
TSBC	Transportation Safety Board of Canada
USA	United States of America
VFR	Visual Flight Rules
VOR	(Very High Frequency) Omni-directional Range Station
VMC	Visual Meteorological Conditions
UTC	Universal Coordinated Time
Z	Zulu time



DEFINITIONS

When the following terms are used in this report, they have the following meanings as per CASR 2001 and ICAO Annex 13;

Aircraft Accident– means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage or the aircraft is missing or completely inaccessible.

Fatal injury - means any injury which results in death within 30 days of the accident.

Flight recorder - Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

Incident - means an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.

Investigation- A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and, when appropriate, the making of safety recommendations.

Serious injury - means any injury which:

- Requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received;
- Results in a fracture of any bone (except simple fractures of fingers, toes, or nose);
- Causes severe hemorrhages, nerve, muscle, or tendon damage;
- Involves any internal organ; or
- Involves second or third degree burns, or any burns affecting more than 5 percent of the body surface.
- Involves verified exposure to infectious substances or injurious radiation.

Serious incident - An incident involving circumstances indicating that an accident nearly occurred.

State of Design - The State having jurisdiction over the organization responsible for the type design

State of Manufacture - The State having jurisdiction over the organization responsible for the final assembly of the aircraft.

Substantial damage - means damage or failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent failings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered "substantial damage" for the purpose of this Report.

OVERVIEW:

On February 2, 2008 The Flight Standard Inspectorate was notified by Western Air Limited that one of its aircrafts, made an emergency landing at Lynden Pindling International Airport at approximately 1730 local. The aircraft in question was C6-SAR, a Metroliner SA-227AC, turbo prop twin engine aircraft on a commercial flight from Clarence Bain Airport, Mangrove Cay, Andros, Bahamas.

The pilot reported to the control tower that he was having problems with the landing gear and wished to continue flying while attempting to troubleshoot and apply emergency gear extension procedures. The aircraft departed the traffic area after permission was granted. According to the pilots, the aircraft continued to the west of Nassau where the emergency procedures were performed.

Despite following the emergency gear extension procedures, the crew could not get the gear to extend. The crew then decided to return to Nassau. The crew landed using the emergency gear extension checklist that addressed landing with one gear not extended. The pilot reported that “despite following the checklist,” the aircraft was not able to maintain directional control upon touchdown and this resulted in a runway excursion.

The aircraft touchdown point was approximately 6,500ft from the threshold of Runway 09. The aircraft initial contact point – touchdown - was between Intersection Juliet (J) and Kilo (K). Several runway lights, runway marking sign and the Precision Approach Path Indicator (PAPI) were damaged by the aircraft on landing roll-out.

The aircraft came to rest slightly to the right of Intersection Kilo (K) approximately 200 feet to the right of Runway 09. (See wreckage distribution). There were no reported injuries to passengers or crew at the scene. Up to the time of this report, this office had not received any official report of any serious or fatal injuries.

On February 2, 2008 between 1700 UTC and 2300 UTC, the weather conditions in the vicinity of Lynden Pindling International Airport had winds at 050 degrees at 10 knots, temperature at 24 degrees Celsius with a dew point at 20 degree and a barometric pressure at 30.17 inches of mercury. The official sunset was at 5:55 pm.

The Manufacture was notified and made party to the investigation. The onsite investigation was conducted by the Flight Standards Inspectorate.

1.0 FACTUAL INFORMATION:

1.1 HISTORY OF THE FLIGHT

On February 02, 2008 at 1703 hours, C6-SAR a Metroliner SA-227AC aircraft, owned and operated by Western Air Limited [Bahamas Basic Air Taxi Operator] as commercial air transport Flight number 515 from Clarence Bain Airport, Mangrove Cay, Andros, Bahamas to Nassau, N.P., Bahamas. C6-SAR made an emergency landing at Lynden Pindling International Airport due to landing gear failure. The time of the accident was confirmed by a video surveillance camera which captured the accident as it developed.

There were 12 passengers and 2 crew members on board the aircraft. The aircraft sustained damages to the right hand wing extension, wing skin, propeller, outboard main landing gear



door and flap and additional the rear fuselage close to ventral fin. Both crews were qualified in accordance with BASR Schedule 14.

1.2 INJURIES TO PERSONS

It was reported that a few passengers were transported to hospital. However, no serious injuries were reported up to the production of this report

1.3 DAMAGE TO AIRCRAFT

Damages to aircraft were as follows, Right wing extension, wing skin, propeller, outboard main landing gear door and flap and additional the rear fuselage close to ventral fin.

1.4 OTHER DAMAGE

Other damage includes several runway lights on the right side of runway 09 starting from approximately 6,500 feet beyond Juliet (J) intersection extending to the intersection Kilo (K). Additionally, damage was reported to the Precision Approach Path Indicator and runway sign indicator to the right side of runway 09.

1.5 PERSONNEL INFORMATION

1.5.1 At the time of the accident, the aircraft was under the command of Captain Devon Robinson assisted by First Officer Quincy Cockburn. Captain Robinson is a 37 year old male. He holds an ATP certificate with Multi Engine Land, issued by the Bahamas Civil Aviation Department with an SA-227 Type Rating with limitations of a required Second-in-command.

Captain Robinson also held a valid First Class Medical Certificate at the time of the accident. At the time of the accident he had logged approximately 2,500 hours on the SA-227. Captain Robinson last satisfactorily completed a Proficiency Check on the SA-227 on 11-25-2007. He has experience on route. In the last 24 hours, 7 days and 90 days preceding the accident, he had logged 6.6, 20.0 and 135.4 hours respectively on the SA-227.

1.5.2 First Officer Quincy Cockburn is a 36 year old male. He holds a valid Bahamian Commercial pilot certificate with Multi-Engine Land – Instrument. He also held a valid First Class Medical. He has experience on route. In the last 24 hours, 7 days and 90 days preceding the accident was he had logged 6.6, 13.5 and 126.3 hours respectively.

First Officer Cockburn last satisfactorily completed a Proficiency check on the SA-227 on 05-08-02.

1.6 AIRCRAFT INFORMATION

SA-227 aircraft serial number AC-598 was manufactured in November 1984 by Fairchild Aircraft Corporation. It was registered in the Bahamas as C6-SAR to Western Air Limited who owned and operated it. It held a valid Certificate of Airworthiness last issued February 28, 2008. The total airframe hours flown since manufacture was 33,337.7 hours. The aircraft had flown 140.8 hours since its last schedule maintenance inspection, (Phase 6 inspection). The aircraft was maintained under Western Air Limited Air Operator Certificate in accordance with BASR Schedules 5, 6, 10 and 12.



Engines

C6-SAR is fitted with Two [2] Garrett Engines; both model number TPE 331-11U-611G. This engine has a time between overhaul [TBO] intervals of 7,000 hours.

Serial Number P-44450C was fitted in the number 1 position. Since overhaul the number 1 engine has accumulated a total of 1,345.1 hours and 720.8 hours since last inspection.

Serial Number P-44257C was fitted in the number 1 position. Since overhaul the number 2 engine has accumulated a total of 5,677.3 hours and 140.8 hours since last inspection.

Props

C6-SAR propellers were manufactured by Dowty Rotol with time between overhaul [TBO] intervals of 5,000 hours.

The #1 propeller serial number is DRG/6932/89. Total time accumulated on the number 1 propeller is 1,233.6 hours since overhaul and 690.7 hours since last inspection.

The #2 propeller serial number is DRG/3030/82. Total time accumulated on the number 2 propeller is 1,057.2 hours since overhaul and 140.8 hours since last inspection.

Aircraft Load

Operational empty weight of the aircraft is listed as 9,500 pounds. Eleven (11) bags were manifested with a combined baggage weight of 305 pounds. The manifested passenger weight for the 12 passengers was 2,080 pounds. The maximum takeoff weight listed is 14,500 pounds.

1.7 Meteorological information *

On February 02, 2008 between 1700 UTC and 2300 UTC, the weather conditions in the vicinity of Lynden Pindling International Airport was winds at 050 degrees at 10 knots, temperature at 24 degrees Celsius with a dew point at 20 degree and a barometric pressure at 30.17 inches of mercury. The official sunset was at 1755 UTC.

1.8 AIDS TO NAVIGATION

Navigational aids were not a factor in this accident.

1.9 COMMUNICATIONS

The pilot was in communication with the control tower at Lynden Pindling International Airport (MYNN) up until the time of the crash.

1.10 AERODROME INFORMATION

Landing was made on Runway 09 at the Lynden Pindling International Airport; which is 8,238 feet in length. Initial touchdown was made approximately 6,500 ft beyond the threshold of runway 09.



1.11 FLIGHT RECORDERS

C6-SAR was equipped with a Cockpit Voice Recorder S/N 265 manufactured by Sundstrand. Data Control, Inc. The recorder was sent to the Engineering Branch, Transportation Safety Board of Canada, Ontario, Canada for analysis, readout and transcription.

The results of the readout revealed 30 minutes of audio data on four tracks however; there was no information relating to flight 515 on the date in question captured on the tape. The tape contained data from a previous flight from Nassau to San Andros which was identified as flight 500 but the exact date and time could not be established. The recorder failed during flight 500 prior to landing and did not work since.

Honeywell, the CVR manufacturer confirmed that the misrouting of the tape at the time of installation was the likely cause of the CVR failure.

1.12 WRECKAGE AND IMPACT INFORMATION

The aircraft was examined at the crash site on February 2nd, 2008 by Accident Investigators from the Flight Standards Inspectorate.

The aircraft came to rest in an upright position approximately 7,000feet from the threshold of Runway 09 at the Kilo (K) intersection at Lynden Pindling International Airport. There was no pre or post impact fire and no ground injuries. The aircraft cut a swath path through several runway end lights, the precision approach path indicator for Runway 27, and the runway identification sign for runway 27 and intersection Kilo (K).

LEFT WING

The left wing remained attached to the fuselage and no visible damage was noted. The left flap and aileron remained attached with no visible damages noted. The left main landing gear also remained attached to the aircraft and no visible damage noted.

LEFT PROPELLER

Left Propeller was feathered and appeared to have received no damages.

RIGHT WING

The right wing remained attached to the fuselage. The right wing tip approximately 6 feet in length was crushed due to the impact with the runway surface. The wing tip however, remained attached to the wing. The aileron remained attached to its flaps hinges. The flap was attached to its hinges and in the half flap position. No damage to the flap was observed.

RIGHT PROPELLER

Two (2) blades of the right propeller were bent backward. The other two did not appear to have been damaged as the propeller was feathered.

FUSELAGE

The emergency exit, located on the right side of the fuselage was intact and used to exit the aircraft after the landing. The entrance door was in the open position. The tail underside of the aircraft was damaged due to contact with the ground.

1.13 MEDICAL AND PATHOLOGICAL INFORMATION

Not a factor in this investigation

1.14 FIRE

There was no pre or post impact fire.

1.15 SURVIVAL ASPECTS

Not a factor in the investigation.

1.16 TESTS AND RESEARCH

No testing conducted.

1.17 ADDITIONAL INFORMATION

Not Applicable



ANALYSIS:

2.1 GENERAL

- **Pilot qualifications** –
 - Pilot was qualified in accordance with Bahamas Civil Aviation (Safety) Regulations. Pilot had accomplished Proficiency Checks and Line Checks on the Metroliner SA227-AC as required by regulations and company. Pilot held currency and appropriate flight and medical certificates.
 - Pilot was employed by Western Air Limited as a Metro-liner SA227-AC PIC at the time of the accident.
- **Weather** – Visual Meteorological Conditions existed at the time and was not a factor in this accident.
- **ATC** – Air Traffic Control was available at the Lynden Pindling International Airport and provided assistance to the aircraft.
- **Aids to Navigation** – navigational aid were operational and was not a factor in the accident.

2.2 AIRCRAFT

The Metroliner SA227-AC aircraft is a twin turbine-engine airplane with a retractable tricycle landing gear configuration.

Inspections accomplished on the aircraft over the past twelve months are as follows:

- A phase Event # 2 Inspection c/w on March 12th, 2007 at 32682.0 hrs.
- A phase Event # 3 Inspection c/w on May 25th, 2007 at 32832.0 hrs.
- A phase Event # 8 Inspection c/w on June 16th, 2007 at 32982.0 hrs.
- A phase Event # 5 Inspection c/w on September 17th, 2007 at 33132.0 hrs.
- A phase Event # 6 Inspection c/w on December 8th, 2007 at 33282.0 hrs.

The airplane was properly certificated, and there was no evidence that airplane maintenance was a factor in the accident.

- **Aircraft performance** – Aircraft performance was not a factor.
- **Mass and balance** – The aircraft was last weighed on November 30th, 2007. Mass and balance report was completed by the pilot for this flight as required by Bahamas Civil Aviation Regulations.
- **Aircraft Navigational Instrumentation** – aircraft navigational instrumentation was operational and was not a factor in the accident.
- **Human factors** – There was no evidence that incapacitation or physiological factors affected the pilot performance prior to the accident.
- **Psychological and physiological factors affecting personnel involved.** - There was no evidence that the pilot suffered any sudden illness or incapacitation which might have affected his ability to control the aircraft.



FINDINGS:

1. Right main landing gear door aft hinge attachment failure resulting in door not opening when gear selected to the down position. See appendix 05.
2. Captain Devon Robinson elected to fly C6-SAR in an un-airworthy condition in violation of BASR Schedule 10.245(b).
(On the ground at Clarence Bain Airport, Mangrove Cay, Andros it was reported that the Gear Door Position light was illuminated on the annunciator panel. It was further reported that the pilot acknowledged the annunciator and went outside and closed the door prior to departure for Nassau. This was the leg which ended with the emergency landing. The pilot late entered into the Technical & Journey Log the right main landing gear failure). See log page 12649 in Appendix 08.
3. Based on documents presented and reviewed it appears that pilot exceeded duty time in violation of BASR Schedule 15. *(Flight Time Record FSI Form 221 shows on Feb. 2, 2008 pilot duty started at 6:30 am and ended at 4:45 pm (1645). However, Technical & Journey log page 12649 shows pilot still flying up until the time of accident which occurred at 5:03pm (1703). See attached Appendix 09.*
4. Based on documents reviewed it appears that crew falsified records in violation of BASR Part I Regulation 9(6) & 15(2). *(On Technical and Journey Log, block time, in, shows 17:18 and time in service, on ground, shows 17:14 local however duty time record shows both pilots off duty around 4:30 pm (16:30 local)) See appendix 08 attached.*
5. Crew failed to follow procedures established in Approved Flight Manual Page 3-23, Landing with Nose and One Main Gear Extended item 3 – Feather **Propellers** after landing on the runway is assured. *(Based on crew statement “the right engine was shut off and feathered about 3 miles and about 1,200 feet and the left was shut off and feathered about 200 feet.”) See appendix 01.*
6. Crew failed to follow Emergency Checklist pages E-24 and E-25 – Landing Gear Emergency Extension - which further stated that use of full flaps was recommended. *(The aircraft after landing was found with flaps selected to the half flap position).* See appendix 02 and 03.
7. Company is using one load manifest logbook for several aircraft in violation of BASR Schedule 12.250 (e)
8. Crews were in a hurry to return to Nassau. When the investigators arrived at the scene the PIC had already departed for his next job.
9. Crew held appropriate and valid medical certificates.
10. Crew had accomplished Proficiency Checks and Line Checks as required by regulations.
11. Crews were qualified in accordance with Bahamas Civil Aviation (Safety) Regulations.
12. Aircraft mass and Balance were within prescribed limitations.



Bahamas Civil Aviation (Safety) Regulations references;

10.245 (b) - The operator of the aircraft shall ensure that these defects are properly rectified prior to the next flight of the aircraft.

12.250 (e) - This uniquely numbered, bound document will be assigned to a specific aircraft operated by the AOC holder until all pages are used.

BASR Part I Regulation 9 (6) IF any person contravenes any provision specified in part B of the said schedule he shall be guilty of an offence and liable on summary conviction to a fine not exceeding three thousand dollars for each offence and each flight and on conviction on indictment to a fine or imprisonment for a term not exceeding two years or both.

BASR Part I Regulation 15 (2) Any person who, having been required in terms of paragraph (1) to produce any document or other article, without lawful cause makes a statement that is false in any material particular, or fails to produce any document or other article which is in his possession or control or to which he has access, shall be guilty of an offence.

Probable Cause

Probable cause has been determined as detachment of the right main landing gear door aft hinge attachment.

(The locking wire which secures the gear door attachment bolt in place was found broken which allowed the attachment bolt to disengage. Once the bolt disengaged the aft door hinge detached from its secure position resulting in the movement of the hinge. This may have resulted in the hinge jamming the gear door resulting in the right main landing gear failure).

Contributing Factors

Pilot action/error has been largely attributed to the cause of this accident in that;

1. The right landing gear door position light illuminated on the Annunciator Panel. The pilot in command went outside and closed the door. Based on his admissions he did not report this defect to maintenance nor did he complete the appropriate technical log entry. *(Had the pilot following the appropriate procedures for reporting mechanical irregularities this accident may have been avoided).*
2. The pilot in command was in a hurry to get home. When the accident investigators arrived at the scene the PIC had already left for his next job. (Get-home-itis) *(This was evidenced as the PIC by telephone called later to say he could not stay at the scene as he had to get to his other job.)*

SAFETY RECOMMENDATIONS:

1. Safety Alert 004 was issued to have all operators of this type of aircraft immediately inspect all aircraft in fleet prior to next flight to ensure the security of this locking wire and replace as necessary.
2. Crew must be removed from active duty and retrained. Interview with crew revealed a lack of knowledge of the systems of the aircraft.
3. Pilot in command must be re-examined for competency to continue to hold a Bahamian pilot certificate.
4. Audit of Western Air pilots records to verify conformance with duty time limitations as per BASR schedule 15. (Evidence showed crews were in active duty, beyond their legal duty time).
5. An audit of Western Air flight preparation records to verify conformance with BASR Schedule 12.250(e). (Crew used same load manifest for several aircraft in violation of BASR 12.250(e)).
6. Western Air Limited aircraft type certificate did not require a type I or II flight data recorder; therefore at the time of the accident they were no in compliance with BASR Schedule 7.175(2).
7. Western Air must ensure crews do not exceeding duty and flight time limitations. At present Western Air Limited does not have an Operations Control Center and Crew Schedule therefore the Director of Operations has all responsibilities relating to these activities.
8. Prior to the addition of any additional aircraft Western Air must establish an oversight system to ensure operations control and Crew Scheduling requirements are complied with during operations.
9. Due to issues arising from this investigation Western Air Limited will now be required to conduct all future checks (Proficiency and Competency) in a simulator. This will allow pilots to practice flight maneuvers, profiles and standard operating procedures. This training is invaluable, due to the fact that crews are not able to simulate numerous malfunctions/procedures in an aircraft.



APPENDIX 01 – AIRCRAFT FLIGHT MANUAL – EMERGENCY PROCEDURE

GEAR UP LANDINGS (continued)

LANDING WITH ALL THREE GEAR UP:

1. Use full flaps.
2. Approach the runway at normal approach speed plus 5 to 10 KIAS.
3. Do not feather propellers until landing on the runway is assured.
4. Shut off electrical power just prior to touchdown (this is to allow use of the pitch trim system until touchdown). Leave batteries on during night landings to permit use of landing lights.
5. Allow aircraft to touch down in a relatively flat attitude and on centerline. Use rudder for directional control.

LANDING WITH NOSE GEAR UP:

1. Use normal approach technique and flap configuration.
2. Feather propellers and shut off electrical power after the mains have touched the runway. Leave batteries on during night landings to permit use of landing lights.
3. Hold the nose of the aircraft off the runway as long as practical, but not so long that pitch control is lost. Put nose on runway gently rather than letting it drop to the runway.

LANDING WITH NOSE GEAR AND ONE MAIN GEAR EXTENDED:

1. Attempt to retract all three gear. Check the position of the emergency gear release lever, the hand pump valve handle and the landing gear control circuit breaker. Transfer the landing gear control to the other essential bus using the transfer switch.
2. If possible, select the runway with the fewest obstructions and flattest terrain on the side of the unextended gear.
3. Feather propellers after landing on the runway is assured.
4. Shut off electrical power just prior to touchdown (this is to allow use of the pitch trim system until touchdown). Leave batteries on during night landings to permit use of landing and taxi lights.
5. Hold the wing with the unextended landing gear off the runway as long as possible. Use brakes and rudder for aircraft directional control. Expect the aircraft to turn into the low wing.

FAA APPROVED: MAY 22/89

EMERGENCY PROCEDURES

3-23
6AC



APPENDIX 02 – LANDING GEAR EMERGENCY EXTENSION CHECKLIST

	1	2	3	4	5	6	7	8	9	10	11	12
EMERGENCY PROCEDURES ABNORMAL PROCEDURES												
	METRO III SA 227 AC PILOT CHECKLIST											
	WESTERN AIR											
	LANDING GEAR											
	LANDING GEAR EMERGENCY EXTENSION											
	1. Airspeed.....173* KIAS MAXIMUM											
	2. Landing Gear Handle.....DOWN											
	3. Emergency Release Lever.....ROTATE AFT											
	4. Hand Pump Valve Handle.....PULL PIP PIN/ROTATE VALVE HANDLE 90° FORWARD											
	5. Emergency Hand Pump.....PUMP AS REQUIRED											
	Gear Indicator.....ALL DOWN AND LOCKED											
	NOTE											
Strong resistance to pump handle motion gives sufficient pressure (500 to 800psi) to insure gear security in addition to the mechanical downlocks.												
If manual extension is used because of failure in the landing gear electrical control system, the hydraulic pressure gauge will continue to indicate approximately 2,000-psi system pressure. In the pressure to the gear down actuator can be detected only by the effort required to move the emergency hand pump.												
If a failure at the bottom of the hydraulic pack allows depletion of all hydraulic fluid, the emergency hand pump will not provide pressure. Nevertheless, step 3 above will allow the landing gear to free-fall to a safe, down and locked position.												
Hydraulic pressure to the nose wheel steering system will not be available following landing gear emergency extension required by either hydraulic failures or gear position selector valve electrical failures. Do not arm nose wheel steering.												
* 175 KIAS in the 16,000 lb. Aircraft												
Continued on the next page												
E-24												



APPENDIX 03 - EMERGENCY CHECKLIST E-25

METRO III SA 227 AC PILOT CHECKLIST		WESTERN AIR	
If the landing gear does not extend, the following additional procedure may allow the gear to extend.			
NOTE			
Extending the landing gear in this manner requires that the airplane be slowed to a minimum safe airspeed. Therefore, this procedure must be performed at high enough altitude to ensure safe flight operation.			
1. Retract the gear.			
NOTE			
If the landing gear will not retract, check that the hand pump valve handle and the emergency release lever have been returned to their normal position.			
2. Use full flaps and slow the aircraft to just above flight idle stall speed.			
3. Place the landing gear handle in the down position.			
4. If the gear fails to extend, repeat the above procedure. If the gear still will not extend, repeat the above procedure using the emergency gear release lever instead of the landing gear handle. (Steps 3, 4, and 5 in the LANDING GEAR EMERGENCY EXTENSION Procedure; page E - 24.)			
E-25			





Flight Standards Inspectorate
CIVIL AVIATION DEPARTMENT

Safety Alert -004

To: All Operators of Fairchild SA226/SA227

From: Walter V. Evans – (Acting) Manager Flight Standards Inspectorate

Date: 2/6/2008

Re: Main Landing Gear Extension Failure

Safety Alert 004 is issued in accordance with ICAO Annex 13, Ninth Edition, July 2001, Chapter 6, Paragraph 6.8 which states “*at any stage in the investigation of an accident or incident, the accident or incident investigation authority of the State conducting the investigation shall recommend to the appropriate authorities, including those in other States, any preventive action that it considers necessary to be taken promptly to enhance aviation safety.*”

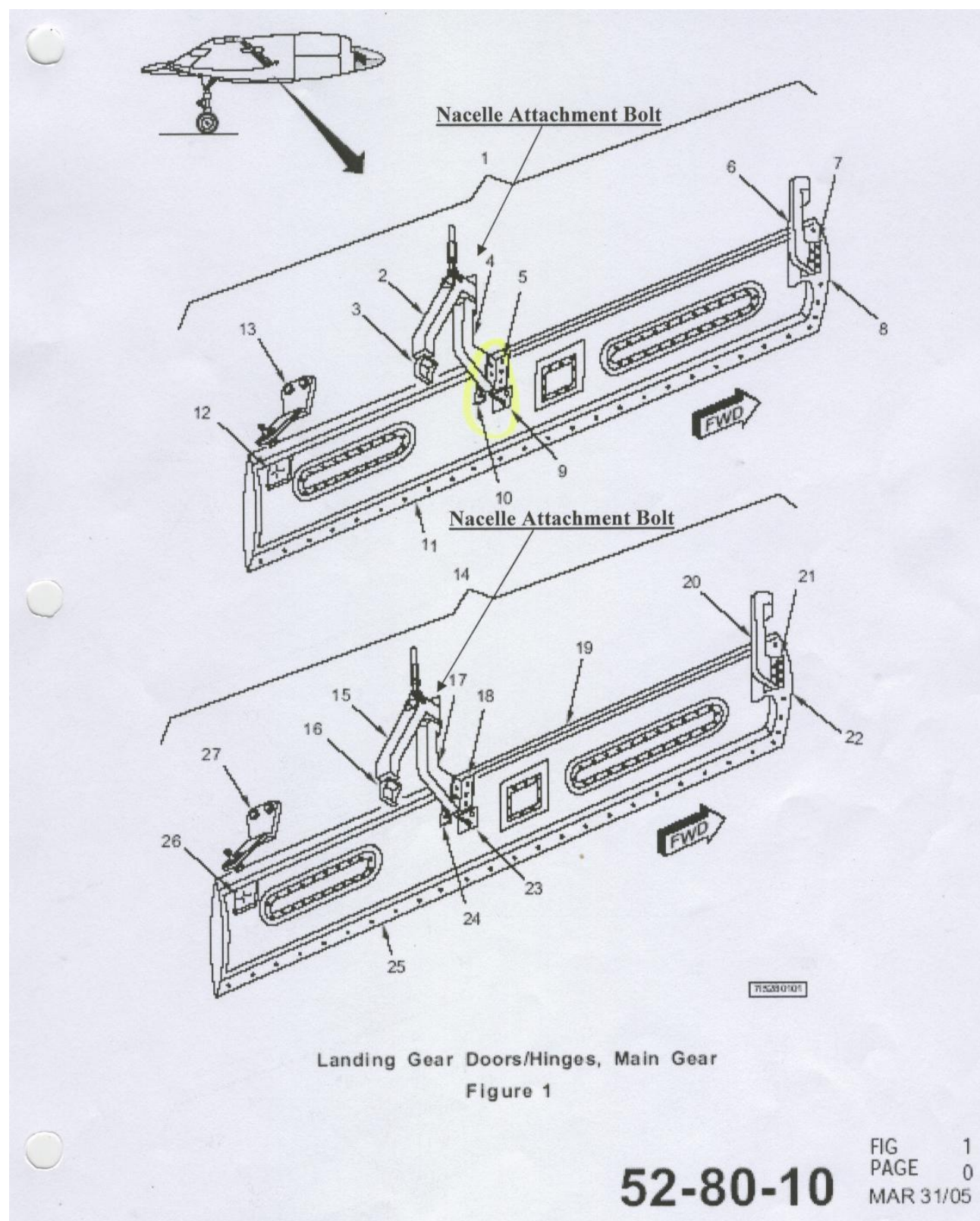
While conducting inspections into the circumstances surrounding a recent incident the following recommendation has been issued: -

All Operators are required to **IMMEDIATELY** check the security of all Main Landing Gear Door Hinge attachment bolt [AN3-15A] at Nacelle. The Operator shall

1. Remove Access/Inspection Panel
2. Remove lock wire
3. Verify the security of bolt
4. Re-secure bolt in accordance with Manufacturer Maintenance Manual
5. Install Access/Inspection Panel
6. Complete the appropriate entry into Technical Log



APPENDIX 05 – GEAR DOOR HINGE SHOWING ATTACHEMENT POINT



APPENDIX 06 – MASS AND BALANCE REPORT FOR AIRCRAFT

WESTERN AIR No. 02938

SA227-AC

MOMENT SCALES FOR WEIGHT AND BALANCE LOADING FORM
OPERATING WEIGHT EMPTY (OWE) INDEX

LOAD LOCATION	WEIGHT POUNDS	
FUEL (USE ONE)	0 TO 1,000 LBS.	500
	1,000 TO 2,000 LBS.	500
	2,000 TO 3,000 LBS.	500
	3,000 TO FULL	500
AWI		130
AFT CARGO	200	100
FWD CARGO	100	100
ROW 1		170
ROW 2		170
ROW 3		170
ROW 4	170	170
ROW 5	400	170
ROW 6	430	170
ROW 7	360	170
ROW 8	360	170
ROW 9	360	170
ROW 10		170

NO EFFECTIVE CHANGE

GROSS WEIGHT COMPUTATION	
OP WT EMPTY	9479
PASSENGERS	2080
BAGGAGE & CARGO	306
AWI	
ZFW	11865
FUEL	1500
GROSS T.O. WT	13365
+ ORO (200)	100
ADJUSTED GTOW	13265
EST FUEL BURN	300
LANDING WT	12965
MAX LANDING WT	14000
MAX ZFW	13130
MAX GTOW	14200

INDEX FORMULA

$$\text{INDEX} = 12 - \frac{[\text{OWE} (268 - \text{ARM})]}{14,000}$$

$$= 12 - \frac{(268 -)}{14,000} =$$

CAUTION: Do not exceed the applicable Maximum Gross Weights. See AFM.

Revised: August 24, 1989

Distribution of Copies: White Copy: Remain in Log Yellow: Leave at Departure Point for This Flight

DATE: Feb 2-08 AIRCRAFT: SAR
 FLIGHT NO: 515 FROM: MAL TO: NAS
 CAPTAIN: Robby 1ST OFFICER: Q. C. W.
 OTHER:



AERODROME CHART - ICAO

AD 2-5-9
20 JAN 2005

NASSAU, BAHAMAS
Nassau Intl

ATIS
118.700 APPROACH
118.300 CLEARANCE
121.700 GROUND
119.500 TOWER

WGS-84
AD ELEV
16 FT

BEARINGS ARE MAGNETIC
ALTITUDES & ELEVATIONS IN FEET

DECLARED DISTANCES

RWY	DIRECTION	THRESHOLD	STRENGTH	TORA	TODA	ASDA	LDA
09	095.63° MAG	N 25 02 09.43 W 077 28 35.21	52/F/C/I/T	8238'	8238'	8238'	8238'
27	275.63° MAG	N 25 02 09.96 W 077 27 24.71	52/F/C/I/T	8238'	8238'	8238'	8238'
14	140.67° MAG	N 25 03 06.58 W 077 28 32.32	52/F/C/I/T	11,018'	11,018'	11,209'	11,018'
32	320.67° MAG	N 25 01 49.86 W 077 27 07.12	52/F/C/I/T	11,018'	11,018'	11,211'	11,018'

AERODROME LIGHTING
Runway lighting: MIRL all curbs length 800'
Approach lighting: Rwy 14: SSALF, length 1200'
Rwy 32: SSALF, length 1200'

DEPARTMENT OF CIVIL AVIATION

APPENDIX 08 – TECHNICAL AND JOURNEY LOG

Western Air Ltd.

Aircraft Registration: **C6-SAR**
Aircraft: Fairchild Metro III SA227-AC m
MMS

Log Page # **No 12649**

RELEASE TO SERVICE FROM A REQUIRED INSPECTION

This aircraft has been inspected in accordance with the inspection indicated and was determined to be in airworthy condition (Schedule 3.23(a)(4)).

Inspection: 1
Signature: 2
Certificate#: 3
Date: 4

PIC PRE-FLIGHT CERTIFICATION

I certify that I am satisfied that the aircraft is airworthy and equipped for the intended flight(s) [Schedule 10.355]

Date of Log Page: 5 **02-02-08**
PIC Name: 6 **Devin Robinson**
PIC Signature: 6a **[Signature]**
Certificate #: 7 **ATP 440**

FLY INFO		AIRPORTS		BLOCK TIME		TIME-IN-SERVICE				FUEL		OIL ADDED		EVENT ENTRY	
FM	To	From	Out	In	Total	Off	On	Total	Cycles	Uplift	Total	Used	#1	#2	
1514	3000	112005	121535	131601	1403	151545	161100	1703	181119		207000	21300	22	23	24 0258.5
515	000	NPS	1602	1718	0.7	1605	1714	0.7			1700	700			0258.8
TOTAL TIMES/CYCLES ACCUMULATED THIS PAGE 25 / 0															
TOTALS BROUGHT FORWARD FROM PREVIOUS PAGE 26															
TOTAL TIMES AND CYCLES TO DATE 27															

PERFORMANCE DATA

Altitude	IAS/MACH	OAT/TAT	ENG #1	ENG #2	TORQUE	PROP SPD	NH%N2	HL%N1	EGT/ITT	F-FLOW	OIL TEMP	OIL PRESS	HOBBS
37	38	39	40	41	42	43	44	45	46	47			

MECHANICAL IRREGULARITY OR MAINTENANCE

51 Selected gear down for hand and then AT main unsafe light came on. ATP 440 J.R.

ACTION TAKEN

TAT: 51	ATA: 52	Airport: 53	Date: 54
55			

RETURN TO SERVICE APPROVAL

Certificate #	Signature	Part #	Serial # Off	Serial # On
57				
58				
59				
60				
61				

Distribution of Copies: White (for the following applications)
Remains in Log: Yellow copy: Pull and leave where irregularity is corrected or deferred: Pink copy: Filed in maintenance records.

PIC Signature: 62 **[Signature]**



APPENDIX – 09 FLIGHT TIME RECORD

FLIGHT TIME RECORD																											
Pilot Printed Name													License Number					Month/Year									
DEVON O. ROBINSON													ATP 440					02-08									
All pilots flying for more than one AOC holder in a given month are required to carry this form while conducting flight operations and update it prior to each CAT flight.																											
Hrs	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAY TOTALS	
																										Flight Time	Flights
Day 1	Flt																										
	Dty																										
	Rest																										
Day 2	Flt																										
	Dty																										
	Rest																										
Day 3	Flt																										
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Day 4	Flt																										
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Day 20	Flt																										
	Dty																										
	Rest																										

I certify that the information contained on this page is correct and was always in conformance to the requirements of Schedule 15 of the Civil Aviation Safety Regulations.

PIC Signature: D. Robinson ATP 440

FSI-Approved Form 221 (2 August 2002)

White copy: Flight Operation Department Yellow Copy: Pilot Record

