



AIRCRAFT INCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8597	
Aircraft Registration	ZS-NXH	Date of Incident	18 December 2008		Time of Incident	1119Z
Type of Aircraft	King Air 200		Type of Operation	Charter		
Pilot-in-command Licence Type	Air Transport	Age	23	Licence Valid	Yes	
Pilot-in-command Flying Experience	Total Flying Hours	1900		Hours on Type	400	
Last point of departure	Mafikeng Aerodrome (FAMM)					
Next point of intended landing	Lanseria Aerodrome (FALA)					
Location of the incident site with reference to easily defined geographical points (GPS readings if possible)						
On Runway 06L at Lanseria Aerodrome (FALA)						
Meteorological Information	CAVOK, Wind: 090/10kts, Temperature: 28, Due Point:06, QNH:1019					
Number of people on board	2 + 2	No. of people injured	0	No. of people killed	0	
Synopsis						
<p>On 18 December 2008 the SACAA was informed of a King Air 200 aircraft that just had a landing gear collapse during landing on Runway 06 at FALA. The SACAA investigators were dispatched to FALA and they arrived within an hour following the accident.</p> <p>Onsite visual inspection of the aircraft revealed no visible failures thus the aircraft was recovered to a hanger at FALA for further investigation. During investigation for a possible retraction and extension tests it was discovered that the port side main landing gear actuator was damaged thus the investigation team could not carry on with the retraction and extension test. A decision to remove the landing gear gearbox and motor for further investigations was then taken.</p> <p>During the testing it was discovered that the landing gear motor had no faults. During the testing of the gear box however, it was discovered that, the main landing gear system malfunctioned as a result of a faulty clutch assembly which caused the electrical motor to run continuously before being protected by a 60 Amp circuit breaker. The emergency system malfunction/failure was attributed to the bending of the left main actuator.</p>						
Probable Cause						
<p>Failure of the landing gear-gearbox clutch assembly resulting on a 60Amp circuit breaker protecting the electrical motor which was running continually as a result of a faulty clutch assembly.</p> <p>Contributory factors.</p> <ol style="list-style-type: none"> 1. Crew's failure to use the emergency system when they became aware of the main system failure. 2. The bending of the left main gear actuator which rendered the emergency system inoperable. 						
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AIRCRAFT INCIDENT REPORT

Name of Owner/Operator : Ferox Investment (PTY) LTD
Manufacturer : Beech
Model : King Air 200
Nationality : South African
Registration Marks : ZS-NXH
Place : Lanseria Aerodrome (FALA)
Date : 18 December 2008
Time : 1119Z

All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose of the Investigation :

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997) this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability**.*

Disclaimer:

This report is given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

- 1.1.1 The crew accompanied by two passengers were on a return charter flight from FALA-FAMM-FALA. The first leg from FALA to FAMM was uneventful and on return from FAMM the incident occurred.
- 1.1.2 The captain was the pilot flying and they were cruising at flight level 160. They were given clearance to decent to 8000 feet (ft). At 9000ft whilst on left base the co-pilot selected gear down and there was no positive indication (three green light in the cockpit).
- 1.1.3 A decision was taken to make a fly past the FALA Tower (TWR) for the Air Traffic Controller (ATC) to indicate to them if the landing gears were down. The ATC confirmed that the gears were down and a decision was taken to land the aircraft.
- 1.1.4 On landing as the gears touched down, the crew felt the aircraft sinking and the co-pilot called for a go-around (by saying to the captain, "gear unsafe take power). They executed a successful go-around.
- 1.1.5 The co-pilot then informed the tower of their problem and also stated their intensions. He (the co-pilot) stated that because he heard a sound emanating from the left gear, he thought that the left gear is the one with a problem. On the second attempt to land after he used the manual gear extension, the aircraft was landed with the left gear touching down first in an attempt to push back the landing gears but to no avail. A

second go around was executed successfully.

- 1.1.6 On a third attempt after he made a mayday call and a passenger briefing, he executed a landing. On touch down, the captain kept the aircraft in a nose up attitude in an attempt to bleed of the speed. The aircraft skidded on its rear under surface and the port side flap before the partial collapse of the landing gear. The landing gears partially collapsed at approximately 200m from the point of touch down resulting on the damage to the port side main gear doors.
- 1.1.7 The aircraft came to a halt approximately 500 meters from the point of touch down on Runway 06L. The passengers were evacuated normally and were taken from the incident site to the terminal building by the emergency services.
- 1.1.8 Both pilots and passengers sustained no injuries as a result of this accident and damage to the aircraft was limited to the rear fuselage under surface, port side landing gear doors, starboard and port side flaps. See Photo1 bellow.

Photo 1: Identifies the aircraft and the position it came to a halt.



- 1.1.9 The aircraft was recovered from the site to an AMO for further investigation. To recover the aircraft, both main gear actuators had to be disconnected at the over centre lock link in order to secure the gears in a down and locked position. The nose gear was braced in to a safe and secure position with the aid of a metal rod.

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	2	-	2	-

1.3 Damage to Aircraft

- 1.3.1 The damage to the aircraft was limited to the rear fuselage under surface, port side landing gear doors, starboard and port side flaps.

Photo 2: shows the damage on the rear belly of the fuselage.



Photo 3: shows the damage to the starboard inboard flap.



Photo 4: shows damage to port side inboard flap.



Photo 5 shows damage to the starboard main landing gear doors.



1.4 Other Damage

- 1.4.1 None

1.5 Personnel Information

Pilot in command (PIC)

Nationality	South African	Gender	Male	Age	23
Licence Number	*****	Licence Type	ATP		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument				
Medical Expiry Date	30 November 2009				
Restrictions	None				
Previous Accidents	None				

PIC Flying Experience :

Total Hours	1900
Total Past 90 Days	150
Total on Type Past 90 Days	150
Total on Type	400

Co-pilot (CP)

Nationality	South African	Gender	Male	Age	43
Licence Number	0270514821	Licence Type	Commercial		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument				
Medical Expiry Date	31 January 2009				
Restrictions	Must wear corrective lenses				
Previous Accidents	None				

CP-Flying Experience :

Total Hours	1289.50
Total Past 90 Days	52.50
Total on Type Past 90 Days	27.40
Total on Type	230.10

1.6 Aircraft Information**Airframe :**

Type	King Air 200 (BE20)	
Serial No.	BB-37	
Manufacturer	BEECH	
Date of Manufacture	Not Known	
Total Airframe Hours (At time of Incident)	7990.3	
Last Phase Inspection (Date & Hours)	07 September 2008	7868.4
Hours since Last Phase Inspection	121.9	
C of A (Issue Date)	27 February 1998	
C of R (Issue Date) (Present owner)	23 June 2004	
Operating Categories	Standard	

- 1.6.1 The LG motor was last inspected on 08 June 2005 at 6979.9 flying hours.
- 1.6.2 The landing gear, gear box was last overhauled on 11 April 2005 at 6979.9 flying hours and 6383 landings. It was overhauled in accordance with Reps King Air 200 Manual Revision 21, February 2005. The gear box had operated for 1010.4 flying hours since the last overhaul.
- 1.6.3 On review of the aircraft documents, it was noted that the aircraft had a landing gear indication problem the day before the accident and the AMO had rectified it by doing the following.

Snag/Fault: "Landing gear control light remains illuminated (RED) with gear up and locked". Flight Folio-Log Number 2816 dated 16 December 2008.

Correction: "Trouble shooting carried out-Found Flap/Throttle switch not secured properly. Secured Properly/Corrected." Flight Folio-Log Number 2816 dated 16 December 2008.

Port Side Engine :

Type	Pratt and Whitney (PT6-41)
Serial No.	PCE-80910
Hours since New	10666.7
Hours since Overhaul	681.1

Port Side Propeller :

Type	Hartzell (HC-B3TN-3G)
Serial No.	BUA-25391
Hours since New	21576.2
Hours since Overhaul	1209.7

Starboard Engine :

Type	Pratt and Whitney (PT6-41)
Serial No.	PCE-80484
Hours since New	11220.3
Hours since Overhaul	681.1

Starboard Propeller:

Type	Hartzell (HC-B3TN-3G)
Serial No.	BUA-24699
Hours since New	9003.5
Hours since Overhaul	681.1

1.7 Meteorological Information

As provided by the South African Weather Services.

Wind direction	090°	Wind speed	10kts	Visibility	CAVOK
Temperature	28°C	Cloud cover	None	Cloud base	None
Dew point	06°C				

1.8 Aids to Navigation

- 1.8.1 The aircraft was fitted with standard navigational equipments as stated in the Minimum Equipment List (MEL) and none was reported unserviceable prior or during flight.

1.9 Communications.

- 1.9.1 The aircraft was fitted with standard communication equipments as stated in the Minimum Equipment List (MEL) and none was reported unserviceable prior or during flight.
- 1.9.2 The pilot had communicated with ATC FALA on frequency 124.0 MHz stating the emergency and his intentions.

1.10 Aerodrome Information

Aerodrome Location	22NM NW of O.R. Tambo International Aerodrome	
Aerodrome Co-ordinates	S25 5623.0 E027 5528.8	
Aerodrome Elevation	4517 feet	
Runway Designations	06L/24R	2910 X 30
Runway Dimensions	06R/24L	1760 X 23
Runway Used	06L	
Runway Surface	Asphalt LCN 65	
Approach Facilities	NDB, ILS, VOR, DME	

1.11 Flight Recorders

- 1.11.1 The aircraft was not fitted with either a Flight Data Recorder (FDR) or a Cockpit Voice Recorder (CVR) and neither were required by regulation to be fitted on the air crafts bellow 5700 kilograms. ZS-NXH weight is 5670 just bellow the required weight limit.

1.12 Wreckage and Impact Information

- 1.12.1 Following a landing gear indication problem and the pilot flight pass over taxi way alpha, the pilot elected to land the aircraft.
- 1.12.2 The aircraft approached was uneventful and on touch down the landing gears started to collapse. The crew then made a go around and as they thought that they had heard a sound from the left main landing gear, they elected to make a second attempt landing the aircraft on the left landing gear first. The touch down was with the left gear first and as the right gear touched down both main gears started to collapse and the crew made a second go around.
- 1.12.3 Following a mayday call and the use of the emergency system, the crew elected to land the aircraft.
- 1.12.4 On the third attempt after touch down, the aircraft was kept at a nose high attitude in an attempt to bleed off the speed. It was during this time that the main landing gears started to collapse and the rear under belly making contact with the runway surface. As a result both inboard flaps and the right landing gear doors also made contact with the runway surface. As the speed went down the nose gear was lowered and it did not collapse, but did not lock in a down position. As a result of the partial collapse of the main landing gears and the nose gear not collapsing, the propellers, wings and

engines were not damaged.

1.12.5 The aircraft came to a halt approximately 500 meters from the point of touch down on Runway 06L facing landing direction.

1.13 Medical and Pathological Information

1.13.1 The pilots and passengers survived without any injuries.

1.14 Fire

1.14.1 There was no evidence of a pre or post impact fire.

1.15 Survival Aspects

1.15.1 The incident was considered survivable as there was no damage to the cabin area and cockpit area which could have inflicted serious or fatal injuries to the occupants. Also both pilots and passengers were properly restrained and the emergency personnel were already on standby next to the runway when the aircraft landed.

1.16 Tests and Research.

1.16.1 During visual inspection of the landing gear system, it was noted that except for the left gear actuator there was nothing wrong with the landing gear system.

1.16.2 A decision was then made to remove the gear box and electrical motor for functionality testing. On removal of the gear box, it was noted that the landing gear circuit breaker (60 AMP) was disengaged. (The 60 AMP circuit breaker can not be reset in flight as it is situated on the floor in the cabin area). Also on removal of the electrical motor, a smell (similar to a burning electrical wire) was also noted. The IIC was informed that only AMO 4 was rated to do tests and overhaul of the gear box. It was then decided to have it tested at this AMO.

1.16.3 Landing gear gearbox description and operation.

The gearbox assembly is powered by an electric motor mounted to the gear assembly. It delivers power to the output shaft through an input coupling, a series of internal reduction gears and clutch assembly. The clutch assembly is designed to slip at 46 to 52 inch-pounds torque at the motor input shaft to prevent possible damage to the gear box assembly. The gear box assembly may be manually operated through an input sprocket which engages directly to the output end of the internal clutch assembly. Two landing gear limit switches are operated by gear common to the power output shaft. The two limit switches are mounted on plates which are movable to permit adjustment of the switches.

Photo 6: Illustrates the landing gear gearbox assembly and electrical motor.



1.16.4 During investigation of the landing gear motor there were no defects found.

1.16.5 During investigation of the landing gear – gearbox (Part Number: 115-811020-13, Serial Number: E 033) it was noted that the gearbox was filled to capacity with grease see photo 7 and 8 bellow. Though the motor being filled with grease would not cause the failure of the landing gear, this was contrary to the requirements of the overhaul manual Which states:

- a. All inside surfaces of the gearbox housing should be brushed slightly with grease.
- b. Do not pack the cavities of the gearbox assembly with grease.
- c. Coat all surfaces of the clutch components sparingly with grease.

Photo 7



Photo 8



- 1.16.6 The gear box clutch assembly was removed from the gear box and placed on a clutch assembly holding tool and was tested for conformance to the requirements of the manufacture manual which states the following:

Using the torque wrench, adjust the clutch nut to obtain a breakaway torque of 370 to 400 inch-pounds. The clutch assembly must have a minimum continuous slippable torque of 350 inch-pounds in either direction.

- 1.16.7 The clutch could only obtain a breakaway torque of 320 inch-pounds and a continuous slippable torque of 280-290 inch ponds.
- 1.16.8 Extract from the Pilot Operating Handbook (POH) _Emergency Procedures_Abnormal Procedures_Page 3A-7_ Revised April 2006.

Landing Gear Manual Extension (Mechanical System)

On aeroplanes prior to BB-73 and BB1193 (except for BB-1158 and BB-1167) not incorporating Beech Kit P/N 101-8018-1.

If landing gear fails to extend after placing the Landing Gear Control down, perform the following:

1. Airspeed – Establish 130 Knots
2. Landing Gear Relay Circuit Breaker (Pilot's sub-panel) – Pull
3. Landing Gear Control – Down
4. Alternate Engage Handle – Lift and Turn Clockwise to the Stop to Engage
5. Alternate Extension Handle – Pump Up and Down until the Three Green Gear-Down Annunciators are Illuminated. Additional pumping when all Three Annunciators are illuminated could damage the Drive Mechanism and Prevent subsequent Electrical Gear Retraction.

If all three green gear-down Annunciators are illuminated:

6. Alternate Extension Handle – Do Not Stow (Proceed to step 8.)

If one or more green gear-down annunciators do not illuminate for any reason and a decision is made to land in this condition:

7. Alternate Extension Handle – Continue Pumping Until Maximum Resistance is Felt, even though this may Damage the Drive Mechanism.
8. Landing Gear Control – Do Not Activate (The Landing Gear Control and the Landing Gear Relay Circuit Breaker must not be activated. The landing gear should be considered UNSAFE until the system is cycled and checked with the airplane on jacks.)

1.17 Organizational and Management Information

- 1.17.1 This was a domestic charter flight to pick up passengers at FAMM and fly them back to FALA.
- 1.17.2 The operator had a valid Air Operator Certificate (AOC number N151D) which was issued on 27 November 2008 with an expiry date of 02 December 2009. The operator was Audited by the Regulator [South African Civil Aviation Authority (SACAA)] on 20 November 2008 and none of the findings had contributed to this accident.
- 1.17.3 The maintenance organisation responsible for the maintenance of this aircraft AMO 1043 had a valid AMO Approval number 1043 which was issued on 01 July 2008 with an expiry date of 30 June 2009. The AMO was audited by the regulator on 27 June 2008 and none of the findings had contributed to the accident.

1.18 Additional Information

- 1.18.1 The landing gear system description:

The landing gear is operated by a split-field series wound motor, mounted on the forward side of the center section main spat. One field is used to drive the motor in each direction. To prevent over-travel of the gear, a dynamic brake relay simultaneously breaks the power circuit to the motor and makes a complete circuit through the armature and the unused field winding. The motor then acts as a generator and the resultant electrical load on the armature stops the gear. The main gear actuators are driven by torque shafts that carry torque from the gear box. The nose gear actuator is driven by Duplex chain that attaches to a sprocket on the gearbox torque shaft. A spring loaded friction clutch between the gear box and the torque shaft protects the motor in the event of mechanical malfunction.

The main gears are held in the down-lock position by a hook and lock plate arrangement on each main gear drag brace. The nose gear is held in the down-lock position by the slight over-center positioning of the nose gear drag brace. The drag brace is locked in position by the actuator. The jackscrew in each actuator hold the main and nose gears in the retracted position.

An alternate extension jack mounted between the pilot and copilot seats provides a means of landing gear extension in the event of a landing gear motor or electrical

system malfunction. See the Emergency Procedures section of the SUPER KING AIR 200 PILOTS OPERATING HAND BOOK for usage instructions.

A landing gear control switch on the pilot's inboard sub-panel actuates the retract and extend circuitry of the landing gear. A solenoid-operated down-lock latch prevents the switch from being actuated while the airplane is on the ground. Should it become necessary, the latch can be overridden by depressing the red down-lock release switch. To prevent accidental retraction of the landing gear while the airplane is on the ground, a safety switch mounted on each of the main gears cuts power to the control circuit when the shocks are compressed.

CAUTION: Never rely on the safety switch to keep the gear down. The landing gear control switch must be in the down position.

1.18.2 Operation:

The King Air 200 (serial number BB-37) had been fitted with a mechanical landing gear system that was controlled through a pilot operated selector switch located in the cockpit on the right side of the pilot's sub-panel. When the switch was selected to either extend or retract the gear, an electric motor drove the landing gear gearbox assembly (Photo 6, 7 and 8).

The main landing gear actuators were driven by torque tubes from the gearbox. The nose gear was driven by a duplex chain from a sprocket on the gearbox torque shaft. Four support bearings in total retained the left and right main landing gear torque tubes. Each outboard torque tube was coupled to a pinion gear within the main landing gear actuator housing.

A spring-loaded clutch between the gearbox and the torque shaft protected the system in the event of a mechanical malfunction. A 60-ampere circuit breaker protected the system from an electrical overload.

Emergency manual extension and retraction of the landing gear was controlled by a floor mounted lever centrally located between the left and right pilot seats. When the lever was manually operated, the landing gear electric motor and gearbox drive mechanisms were overridden, thus allowing extension or retraction of the landing gear system.

Photo 9: Illustration of the mechanical landing gear system from the Super King Air 200

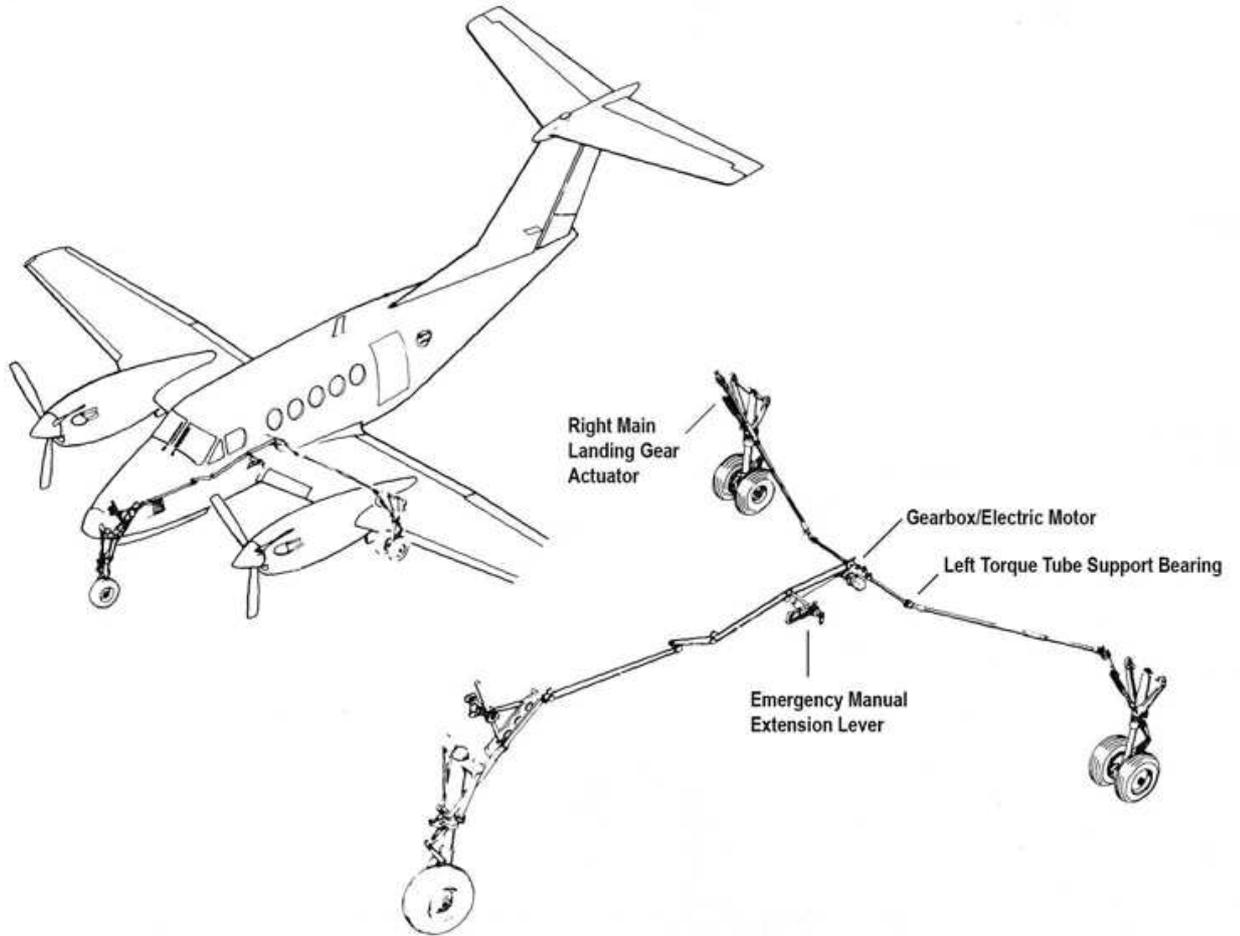


Photo 10: Illustrated part breakdown of the main gear retraction mechanism detailing the torque and gearbox arrangement.

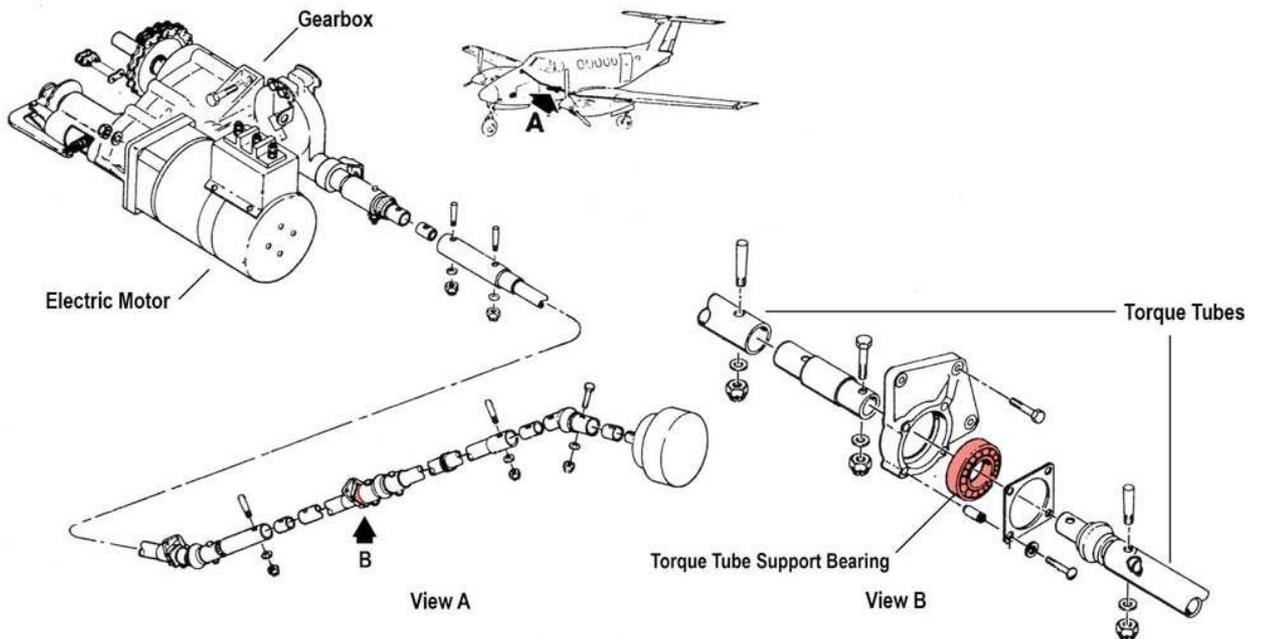
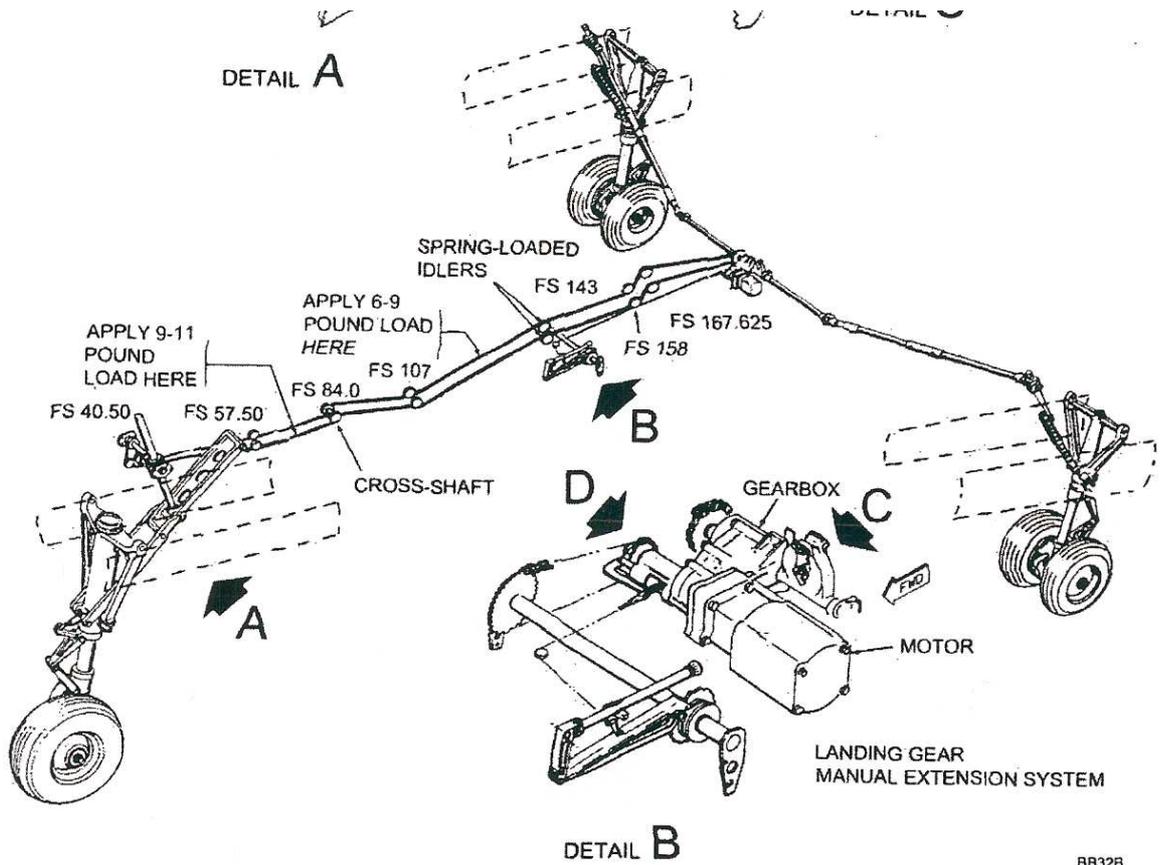


Photo 11: Illustration of the mechanical landing gear system with the emergency from the King Air 200



BB32B
985214AA

1.18.3 Following the recovery of the aircraft to an AMO, it was discovered that the landing gears could not be cycled as the port hand gear actuators was bent as a result of the accident. See Photo 9 below.

Photo 12: Illustrates the damaged port side main gear actuator.



1.19 Useful or Effective Investigation Techniques

1.19.1 None

2. ANALYSIS

- 2.1 The aircraft had a landing gear indication problem on 16 December 2008 and the problem was rectified. On a return flight from FMM on 18 December 2008 whilst the aircraft was on approach for landing on Runway 06L at FALA, the crew experienced a landing gear indication problem. A decision was made by the crew to make a fly pass overhead Taxiway A in order to allow the Air Traffic Control ATC-FALA to confirm that the landing gears were down. FALA-ATC did confirm that the landing gears are down and the crew elected to land the aircraft. At this stage no declaration of an emergency was made and no attempt was made to use the emergency landing gear extension.
- 2.2 The crew elected to land the aircraft and after touch down, the aircraft started to sink as if the landing gears were collapsing. The crew then made a go around and decided to make a second attempt for a landing. As the crew indicated that they may have heard a sound on the left hand main gear, they thought that the problem is on the left gear. Instead of using the emergency landing gear extension, they opted for a second landing and in this landing, they would try to land on the left gear first in an attempt to lock the left gear. After touch down (with the left landing gear first) and as the right main gear touched the runway, the aircraft again started to sink. The crew then made a second go around. The crew elected to attempt the third landing and at this stage they declared an emergency and used the emergency landing gear extension.
- 2.3 On the third attempt for a landing and after touch down, the crew kept the aircraft on a nose up attitude to bleed off the speed. As the aircraft settled on the runway, the landing main landing gears collapsed. The aircraft continued skidding for approximately 500 meters before it came to a halt with the nose gear not collapsing.
- 2.4 On visual inspection on site no anomalies were noted and it was decided to recover the aircraft to an AMO where further investigation would be carried out. On investigation it was noted that the left hand main gear actuator was bent thus, no retraction tests were possible. No other anomalies were noted on the landing gear system except for the 60 Amp circuit breaker which had popped out. The investigating team then elected to remove the landing gear-gearbox and electrical motor for further investigation on both components.
- 2.5 The investigation of the landing gear motor revealed no anomalies. On investigating the landing gear-gearbox however, the investigating team noted the following:
- a. The gear box was filled to capacity with grease. This fact however, would not have necessarily caused the failure of the landing gear system. The fact was in contrast with the requirements of the overhaul manual used to overhaul this component in that, it requires that the grease should be applied sparingly to the cavities of the gearbox.
 - b. The inspection of the clutch and gears revealed no visible anomalies however, on testing clutch assembly it was noted that the clutch could not reach the requirements of the overhaul manual which states the following:

Using the torque wrench, adjust the clutch nut to obtain a breakaway torque of 370 to 400 inch-pounds. The clutch assembly must have a minimum continuous slippable torque of 350 inch-pounds in either direction.

Result of the clutch test

The clutch could only obtain a breakaway torque of 320 inch-pounds and a continuous slippable torque of 280-290 inch pounds.

- 2.6 The investigating team concluded that this was the primary cause of the landing gear system malfunction. As indicated above on point 2.7b the force required for lowering and locking the landing gear is 370-400 inch-pound torque, the clutch could only reach 320 inch-pound. The clutch is also required to have minimum continuous slippable torque of 350 inch-pound and it could only produce 280-290 inch-pound torque. This resulted on the motor running continuously until the 60 Amp circuit breaker engaging and protecting the motor. This then rendered the normal system inoperative thus, the need to use the emergency system.

The reason why the emergency system could not get the gears down and locked could be attributed to the left gear actuator. The left gear actuator was bent probably as a result of an attempt by the crew to land the aircraft on the left gear first during their second landing attempt. Emergency manual extension and retraction of the landing gear was controlled by a floor mounted lever centrally located between the left and right pilot seats. When the lever was manually operated, the landing gear electric motor and gearbox drive mechanisms were overridden, thus allowing extension or retraction of the landing gear system. Manual operation is attained through an input sprocket which engages directly to the output end of the internal clutch assembly.

- 2.7 As all landing gear drive systems will rely on being operated through the input sprocket which engages directly to the output end of the internal clutch assembly. The bending of the left hand actuator was identified as the cause of the emergency landing gear system malfunction or failure.
- 2.8 The POH requires that the crew should use the emergency landing gear system should there be a problem with the main landing gear system. The crew failed to use the system and only used it on the third and final attempt for a landing.

3. CONCLUSION

3.1 Findings

- 3.1.1 The crew were properly licensed for the type of operation they conducted.
- 3.1.2 The crew did not follow the requirements of the POH in that they attempted to land twice prior to the use of the emergency landing gear system on the third and final attempt.
- 3.1.3 The crew attempted a landing twice before committing for a landing on the third attempt.
- 3.1.4 The aircraft had an indication landing gear system failure resulting on the crew making

a fly past FALA tower for ATC confirmation on landing gear down.

- 3.1.5 With the exception of the landing gear system, no other anomalies were noted with the aircraft systems.
- 3.1.6 The main landing gear system malfunctioned as a result of a faulty clutch assembly which caused the electrical motor to run continuously before being protected by a 60 Amp circuit breaker.
- 3.1.7 The emergency system malfunction/failure was attributed to the bending of the left main actuator.
- 3.1.8 The left main gear actuator had bent when the crew attempted to lock the landing gear by landing on the left gear first.

3.2 Probable Cause/s

- 3.2.1 Failure of the landing gear-gearbox clutch assembly resulting on a 60Amp circuit breaker protecting the electrical motor which was running continually as a result of a faulty clutch assembly.
- 3.2.2 Contributory factors.
 - 3.2.2.1 Crews failure to use the emergency system when they became aware of the main system failure.
 - 3.2.2.2 The bending of the left main gear actuator which rendered the emergency system inoperable.

4. SAFETY RECOMMENDATIONS

- 4.1 None

5. APPENDICES

- 5.1 None

Submitted through the office of the SM.