SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigations Division** Form Number: CA 12-12b

AIRCRAFT INCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:		CA18/3/2/1202	
Aircraft Registration	ZS-KGW	**Date of Accident**	26 March 2018			**Time of Accident**	0445Z
Type of Aircraft	Beechcraft B200		**Type of Operation**			Private (Part 91)	
Pilot-in-command Licence Type		Commercial Pilot's Licence	**Age**	52		**Licence Valid**	Yes
1st Officer Licence Type		Commercial Pilot's Licence	**Age**	40		**Licence Valid**	Yes
Pilot-in-command Flying Experience		Total Flying Hours	9105			Hours on Type	2 434.4
1st office Flying Experience		Total Flying Hours	4 471.2			Hours on Type	1 913.6
Last point of departure	Wonderboom Airport (FAWB), Gauteng Province						
Next point of intended landing	OR Tambo International Airport (FAOR), Gauteng Province						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
At FAWB on Runway 29 at a point with GPS Coordinates, S25°39'13" E028°13'28"							
Meteorological Information	Wind direction: variable, air speed: calm, air temperature: 12°C, visibility: 10 km						
Number of people on board	2 + 0	**No. of people injured**	0	**No. of people killed**	0		
Synopsis							

A King Air B200 operated by Multimedia Entertainment Group Air (Pty) Ltd departed FAWB with a crew of two on-board. The flight was intended to pick up passengers at FAOR for a private charter to Lichtenburg in the North West Province. Upon arrival approach at FAOR, the landing gear selection did not respond as per normal with a three green light indication in the cockpit. The crew then elected to orbit the aircraft in an air traffic safe airspace in an attempt to extend the landing gear. Emergency activation of the landing gear was attempted; however the pumping lever handle got stuck. After several failed attempts, the crew decided to fly back to FAWB to execute a belly landing. Upon arrival at FAWB, the aircraft landed wheels up on runway 29. Emergency services had been informed through ATC and were on standby. The aircraft engines had been shut down at a safe distance to the aerodrome prior to landing. The aircraft sustained damage to both engines' propeller blades, landing gear doors and the underside cargo port. Neither crew member sustained any injury during the accident sequence.

The investigation revealed that the cause of the nose gear failure to extend was attributed to the failure of the actuator sleeve which led to misalignment of the actuator drive shaft and chain resulting on a jamming of the chain and undercarriage system failure.

Probable Cause

The nose gear failure to extend was attributed to the failure of the actuator sleeve which led to misalignment of the actuator drive shaft and chain resulting on a jamming of the chain and undercarriage system failure. 1.6

SRP Date	13 November 2018	Release Date	

AIRCRAFT INCIDENT REPORT

Name of Owner	**:** Tacet Transport (Pty) Ltd
Name of Operator	**:** Multimedia Entertainment Group (Pty) Ltd
Manufacturer	**:** Beechcraft
Model	**:** B200
Nationality	**:** South African
Registration Marks	**:** ZS-KGW
Place	**:** FAWB, Runway 29
Date	**:** 26 March 2018
Time	**:** 0445Z

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 (2011) this report was compiled in the interests of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and ***not to establish blame or liability****.*

Disclaimer:

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

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 The King Air B200, operated by Multimedia Entertainment Group (Pty) Ltd took off from Wonderboom Aerodrome (FAWB) with the intention to pick up passengers at OR Tambo International Airport (FAOR) for a scheduled private charter flight to Lichtenburg in North West Province. According to the pilot, upon approach for landing at FAOR, they were cleared to 8 000 ft ILS approach for runway (RWY) 21L. They proceeded with the landing checklist and upon extending the gears, a loud noise was heard from the front of the aircraft, sounding like something broke from the nose gear wheel well. They then reported their situation and requested a go-around and vectors for FAWB. Vectors were given and they were instructed to maintain at 8 000 ft. Upon handover to FAWB air traffic control (ATC), the crew notified the ATC at FAWB about their situation. They requested the airport fire and rescue to be on standby. The crew then opted to try a manual extension, which was unsuccessful.

1.1.2 They then requested a fly-by for the aerodrome fire and rescue to verify whether the gear was retracted, as per cockpit indication, and this was confirmed. The crew then joined the circuit for landing on runway 29. The aircraft was then configured for an emergency landing, during which the engines were shut down at approximately 100 m from the threshold of runway 29 and then feathered propellers manually. The aircraft landed wheels-up and skidded for approximately 450 m before coming to a full stop approximately 350 m from the runway 24 threshold with runway 29. The wheels-up landing was executed successfully. The aircraft sustained damage to two propeller blades on each engine assembly, landing gear doors and under cargo compartment port.

Figure 1: The aircraft as it was found at the accident site

1.1.3 The accident occurred on RWY 29 pass threshold of RNY 24 following a wheels-up landing during daylight conditions at FAWB (GPS co-ordinates S25°39'12.32", E28°13'18.26", field elevation 4 062 ft).

1.2 Injuries to Persons

1.2.1 No injuries were sustained by any of the crew at the time of the accident sequence.

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

1.3 Damage to Aircraft

1.3.1 The aircraft sustained damage to two propeller blades on each engine, the landing gear doors and under cargo compartment port. Refer to 1.12 for Wreckage and Impact Information.

Figure 2: Aircraft on its belly surrounded by the foam

1.4 Other Damage

1.4.1 Runway damage was limited to scratch marks as a result of the aircraft skidding for a distance of approximately 450 m.

1.5 Personnel Information

Pilot-in-command:

Nationality	South African	Gender	Male	Age	52
Licence Number	0270125354	Licence Type	Commercial		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument				
Medical Expiry Date	30 November 2018				
Restrictions	Contact lenses				
Previous Accidents	None				

Pilot-in-command flying experience:

Total Hours	9 105.0
Total Past 90 Days	11.6
Total on Type Past 90 Days	11.6
Total on Type	2 434.4

1st officer:

Nationality	South African	Gender	Male	Age	40
Licence Number	0270511603	Licence Type	Commercial		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument				
Medical Expiry Date	31 August 2018				
Restrictions	None				
Previous Accidents	None				

1st Officer flying experience:

Total Hours	4 471.2
Total Past 90 Days	134.9
Total on Type Past 90 Days	21.0
Total on Type	1 913.6

1.6 Aircraft Information

1.6.1 The Super King Air 200 and B200 are metal airplanes with a fully cantilevered, low wing design. They use twin Pratt and Whitney turboprop engines, and a T-tail empennage. Both airplanes are certificated for flight as Normal Category Aircraft. By carrying the required operational equipment, they may be used during VFR, IFR, and in known icing conditions.

The aircraft ZS-KGW was previously involved in an accident on 26 August 2016, where it was hit by another aircraft when it was parked on the runway side in the area of North West Province. The damage, which was mostly on the left-hand wing and the left-hand engine, was attended to and repairs were made.

Figure 3: ZS-KGW, aircraft type

Airframe:

Type	King Air 200	
Serial Number	BB-381	
Manufacturer	Beechcraft	
Date of Manufacture	1978	
Total Airframe Hours (At time of Accident)	25 030	
Last MPI (Date & Hours)	5 February 2018	25 020.1
Hours since Last MPI	9.9	
C of A (Expiry Date)	31 March 2019	
C of R (Issue Date) (Present owner)	1 March 2016 (Tacet Transport (Pty) Ltd	
Operating Categories	Standard Part 135	

Engine 1:

Type	Pratt & Whitney PT6A-41
Serial Number	PC-E80212
Hours since New	14 077.4
Hours since Overhaul	2 326.4

Engine 2:

Type	Pratt & Whitney PT6A-41
Serial Number	PCE-80667
Hours since New	14 246.4
Hours since Overhaul	2 298.0

Propeller 1:

Type	Hartzell HC-B3TN-3N
Serial Number	BUA22687
Hours since New	25 114.1
Hours since Overhaul	286.6

Propeller 2:

Type	Hartzell HC-B3TN-3N
Serial Number	BUA 30072
Hours since New	4 770.2
Hours since Overhaul	3 256.4

1.6.2 Landing gear

Mechanical Landing Gear (information extracted from Super King Air 200/B200 Pilot Training Manual):

The retractable tricycle landing gear is extended or retracted by a 28 V motor and gearbox. Aircraft serial numbers BB-2 to 1192 has a mechanical landing gear system. A split-field electric motor drives a gearbox that, in turn, provides force to the nose and main gear actuators through a chain drive and torque tubes. One field drives the motor to retract the gear while the second drives the motor in the opposite direction to extend the gear. A squat switch on the right main gear torque knee opens the landing gear control circuit when the strut is compressed (aircraft on ground). The squat switch also actuates a solenoid-operated down lock hook on the landing gear control switch to prevent the handle from being raised when the aircraft is on the ground.

The hook automatically unlocks when the aircraft leaves the ground. If the down lock solenoid fails, press the red DOWNLOCK REL button alongside the landing gear handle to release the down lock. The LDG GEAR CONTROL HANDLE on the pilot's right subpanel controls the system. A solenoid-operated lock prevents the handle from being raised when the airplane is on the ground. This can be bypassed by the red DOWN LOCK REL button just to the left of the control handle. Individual gear position is indicated by three green lights adjacent to the handle. The gear handle contains two red lights, which illuminate when the gear is in transit or not properly locked.

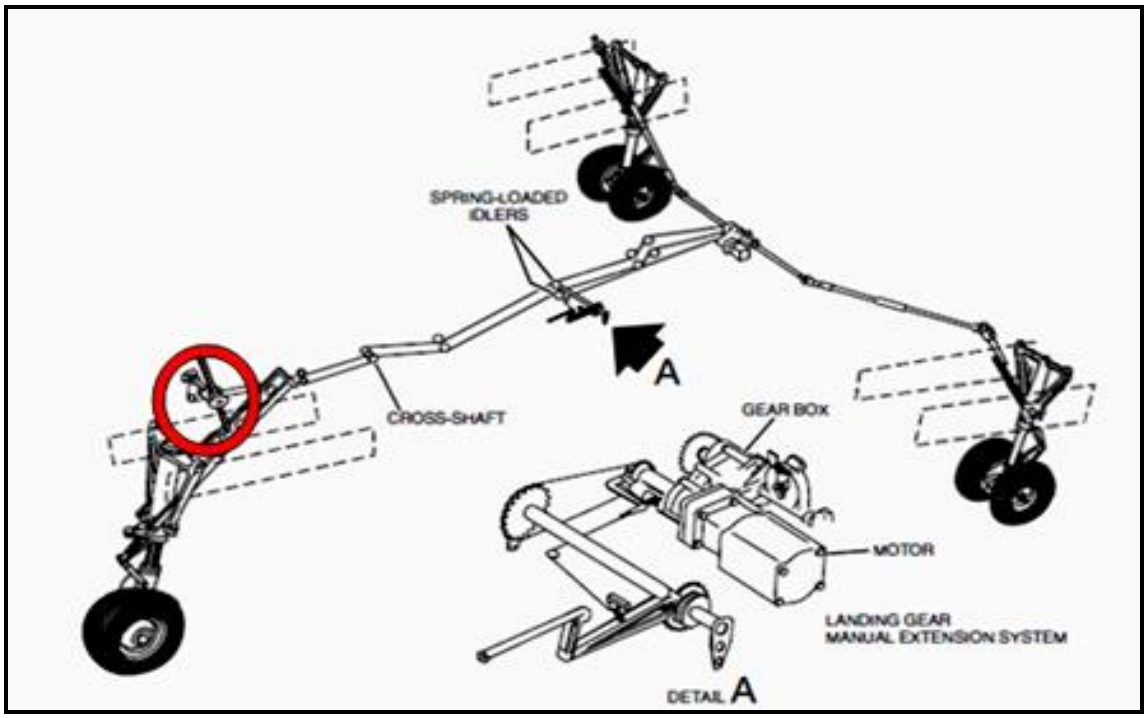

Figure 4: Schematic structure of the aircraft type landing gears

Two red parallel-wired indicator lights in the landing gear control handle indicate that the gear is in transit or unlocked. The red lights extinguish in a GEAR UP condition. The lights receive information from the normally closed, up-position switches, one of which is in the upper portion of each wheel well. When the gear is in the fully retracted position, each strut actuates its respective switch and opens the circuit from the in-transit light to ground.

As the gear moves from the fully retracted position, the switches close and illuminate the in-transit light. The in-transit light extinguishes when the drag brace in each landing gear actuates its respective down lock switch.

Illumination of the landing gear in-transit light indicates one or more of the following conditions:

- Landing gear handle is in the UP position and the aircraft is on the ground with weight on the gears
- One or both power levers are retarded below a pre-set 79% N1 level and at least one landing gear is now down and locked
- Any one or more landing gears are not fully retracted or in the down and locked position
- One or more of the landing gears are not down and locked, and the flaps are selected past approach. The warning horn only can be silenced by retracting flaps or extending the landing gear.

Manual extension (electric gear):

If the normal landing gear system fails, the gear can be manually extended. Pull the LANDING GEAR RELAY circuit breaker on the pilot's right panel and verify that the gear handle is in the DOWN position. Pull up on the EMERGENCY ENGAGE handle and turn clockwise about 60° to engage the emergency extension mechanism.

Pumping the manual extension lever mechanically drives the nose and main landing gear actuators through the motor gearbox, chain drive and torque tubes. When the landing gears reach the extended position and the green down and locked lights illuminate, discontinue use of the manual extension lever to prevent damage to the landing gear operating mechanism.

Warning system:

During flight, a warning horn and red lights in the landing gear handle warn the crew of improper landing gear position relative to flap and/or power lever position.
They also activate when the gear handle is up while on the ground.

1.6.3 All maintenance documented records were reviewed during investigation. All service bulletin and ADs issued by the aircraft manufacture in particular relating to the landing gear were complied with by both maintenance organisations and the owners as per listed in aircraft history records. According to the aircraft maintenance manual, the landing gear rigging on the nose gear retraction/extension chain was conducted in accordance with all necessary steps followed during maintenance on the nose gear retraction chain. The pre-flight checks only involve checking the security of nose strut, brake hose, nose steering, tire wheel well, doors and the landing lights.

1.7 Meteorological Information add the source and location

1.7.1 Meteorological information as obtained by aerodrome information

Wind direction	Variable	Wind speed	Calm	Visibility	10 km
Temperature	12°C	Cloud cover	None	Cloud base	None
Dew point	9°C				

1.8 Aids to Navigation

1.8.1 The aircraft was equipped with navigational equipment approved by the Regulator. There were no defects noted prior to and at the time of the incident.

1.9 Communications

1.9.1 The aircraft was equipped with a high-frequency radio approved by the Regulator. There was no defect recorded regarding the radio.

1.10 Aerodrome Information

1.10.1 Aerodrome information as per known information available on the official website

Aerodrome Location	FAWB, Gauteng Province	
Aerodrome Co-ordinates	S25°39'13" E028°13'28"	
Aerodrome Elevation	4 095 ft above mean sea level (AMSL)	
Runway Designations	06/24	11/29
Runway Dimensions	1 280 m	1 828 m
Runway Used	29	
Runway Surface	Asphalt	
Approach Facilities	DBN, VOR	

1.11 Flight Recorders

1.11.1 The aircraft type was not equipped with flight data recorder nor was it a requirement by the Regulator.

1.12 Wreckage and Impact Information

1.12.1 The aircraft accident occurred during a wheels-up landing on RWY 29 at FAWB. The aircraft contact with runway caused scrape marks for a distance of approximately 450 m along the runway surface. No serious damage was noticed on the runway surface.

Figure 5: The scratch marks on the runway

1.12.2 The aircraft's under cargo port received extensive damage due to contact with the runway surface.

Figure 6: Damage on the under cargo port and the main landing gear doors

1.12.3 More damage was noticed on the two bottom positioned propeller blade tips on each engine. The damage was consistent with damage caused by surface scraping when the engines are not turning. The aircraft was equipped with a three-bladed propeller on each engine.

Figure 7: Damage to four propeller blades; two on each engine side

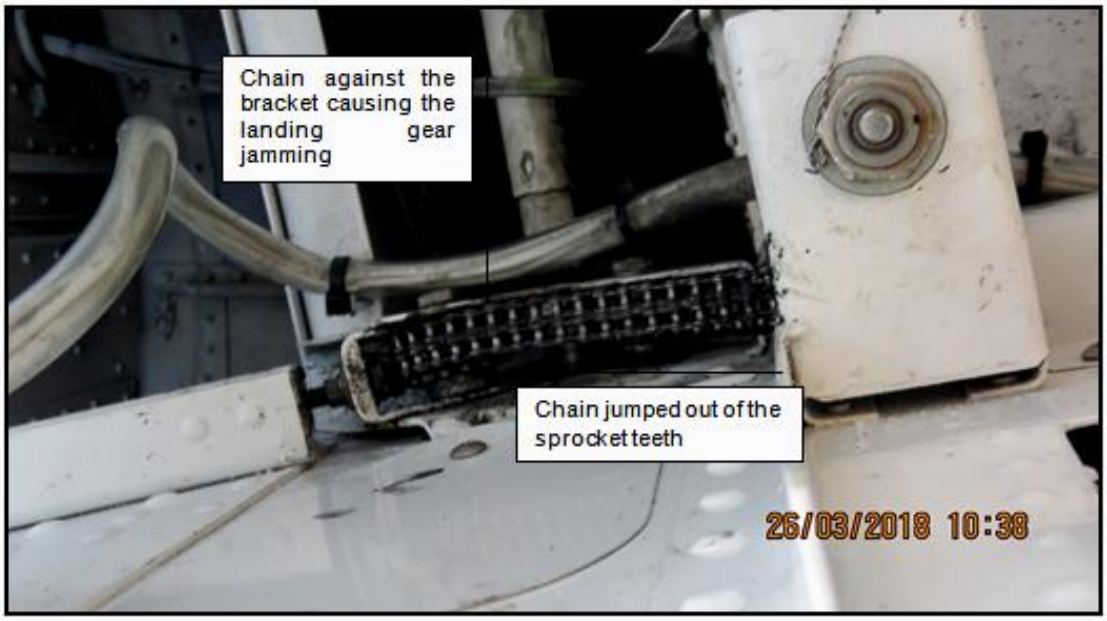

Figure 8: The jammed retraction chain

1.12.4 The landing gear doors and the bottom of the engine cowlings damaged due to surface scraping during the wheels-up landing. This damage only occurred after some distance, after the under cargo port had been completely damaged, and the aircraft dropped to make contact with surface on its belly and the two engine cowlings.

1.12.5 Preliminary onsite investigation observation showed that the retraction chain got jammed against the airframe assembly, causing the landing gears to jam during extension and retraction attempts. The chain had a slaggy tension on top with the bottom chain under tension.

1.12.6 It was observed that the sleeve on the nose gear retraction/extension actuator had come off during operation.

1.13 Medical and Pathological Information

1.13.1 No injuries were sustained during this incident.

1.14 Fire

1.14.1 There was no evidence of a pre- or post-impact fire. The airport fire and emergency crew were already in position at the time of the emergency wheels-up landing, with hydrant foam spread on the runway.

1.15 Survival Aspects

1.15.1 No damage was noticed in the aircraft cockpit or on any seats. The attitude of the aircraft at the time of the incident could not induce any hazardous conditions that could cause any harm to the occupants. Both crew members were wearing their shoulder harness at the time of the incident.

1.15.2 The airport fire and rescue services were on standby and applied foam on the aircraft after the aircraft landed,

1.16 Tests and Research

1.16.1 The preliminary investigation determined that the cause of the landing gear not extending was due to a jammed extension/retraction chain in the nose wheel well. (See: Figures 4 and 8.)

1.16.2 Figures 9 and 10 were extracted from the aircraft type illustrated part catalogue (IPC). The red circle shows where the retraction/extension chain got jammed against component 675 (bracket) and the bracket chain lightener. The retraction/extension chain consists of a set of two chains combined together, running on a sprocket (520) that consists of two sets of teeth. During the investigation, it was observed that the chain jumped out of one set of sprocket teeth onto the other, causing the chain to be against bracket 675.

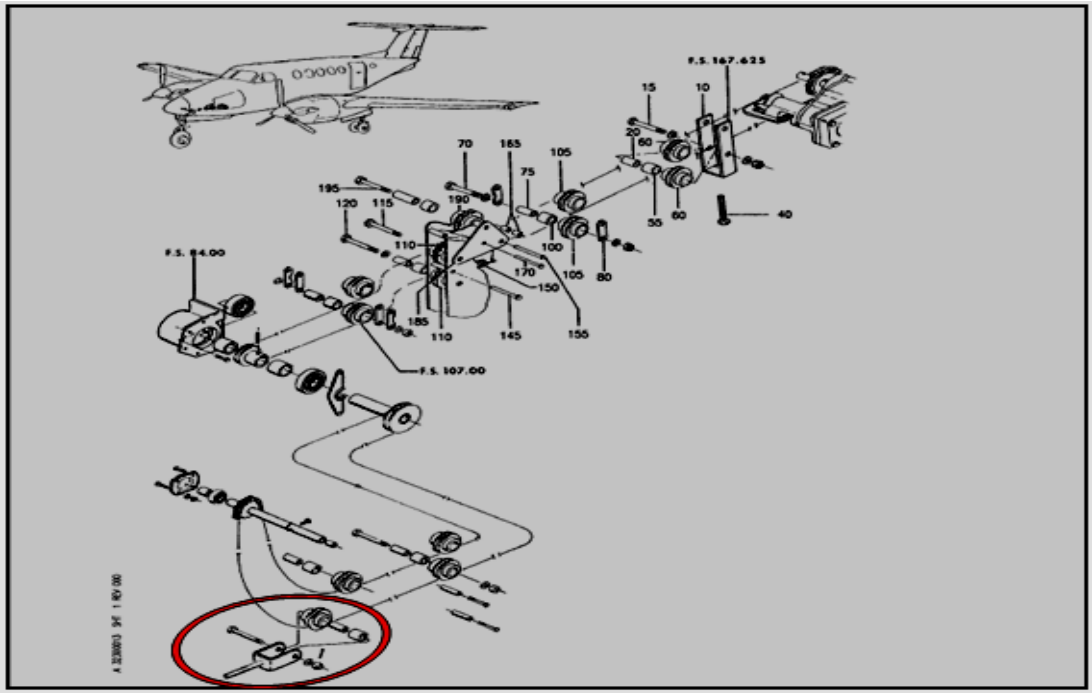

Figure 9: Schematic of illustrated parts of the nose gear retraction mechanism

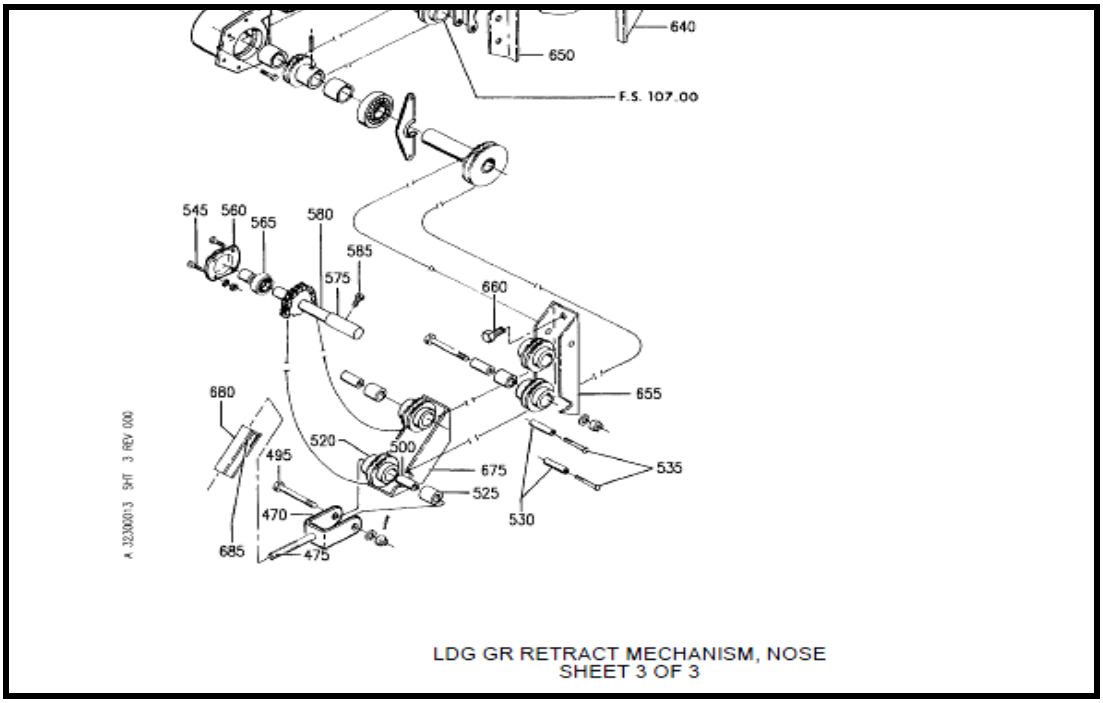

Figure 10: The affected area of the retract mechanism

Figure 11: The actuator assembly bracket that got damaged

1.16.3 Maintenance on the retraction and extension mechanism

Technical report as per post-incident inspection by the aircraft maintenance organisation (AMO):

On initial inspection, it was found that the nose gear forward operating chain was jammed against the assembly bracket. The chain had moved out of the sprocket due to misalignment. This prevented the gear from operating either normally or during emergency procedure. Further inspection revealed that the right-hand actuator support bearing and inner sleeve had egressed out of the bearing plate. With the chain tension to the short chain driven torque shaft, the outboard small end of the torque shaft disengaged from the side wall bearing in the landing gear bay. Chain tension was able to distort the actuator mounting and cock the torque shaft, thereby misaligning the chain, which then tempered the chain tensioner sprocket and caused the chain entrapment. (See: Figure 8.) Figure 12 shows the actual position of the actuator assembled in a normal condition.

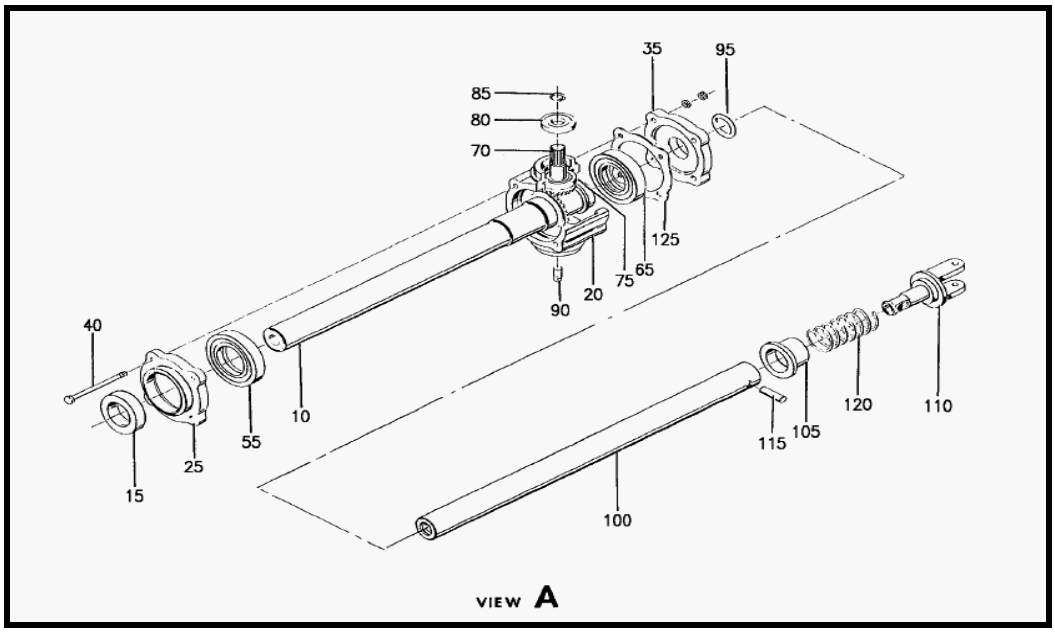

Figure 12: The nose gear actuator schemetic

1.16.4 The sleeve acts as a spacer that helps to keep the actuator in position within the bearing assembly. The two brackets hold the actuator in position during assembly and operation as shown in Figure 12. If the sleeve is removed, the space induced will allow the actuator to move sideways (rotate along its longitudinal axis) during operation. The sleeve also holds the actuator in position to allow the chain-driven shaft to connect to the actuator inserted through the spline fitting. (For parts names as numbered, refer to Appendix A.)

Figure 13: The damaged sleeve as it was found

1.16.5 The chain is also subjected to tension, which can also be longitudinally spread along the actuator driving shaft. The shaft, with a set of chain sprockets, is assembled on the airframe and connects to

the actuator through a spline end.

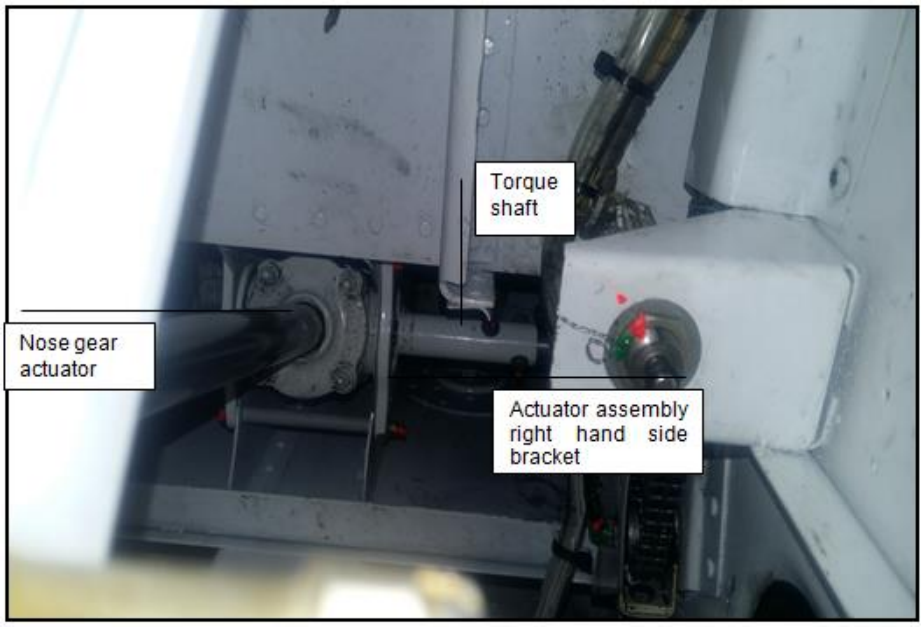

Figure 14: An actuator in a normal condition on assembly

1.16.6 According to the engineer (who is rated and has been working on landing gear type overhaul for over years, following the incident he inspected the chain for wear and conducted tension tests; all was in order. Measurements for the chain length were taken against tension calculations and all was in order. All steps from the maintenance manual were followed during the mandatory periodic inspection (MPI) maintenance carried out prior to the incident.

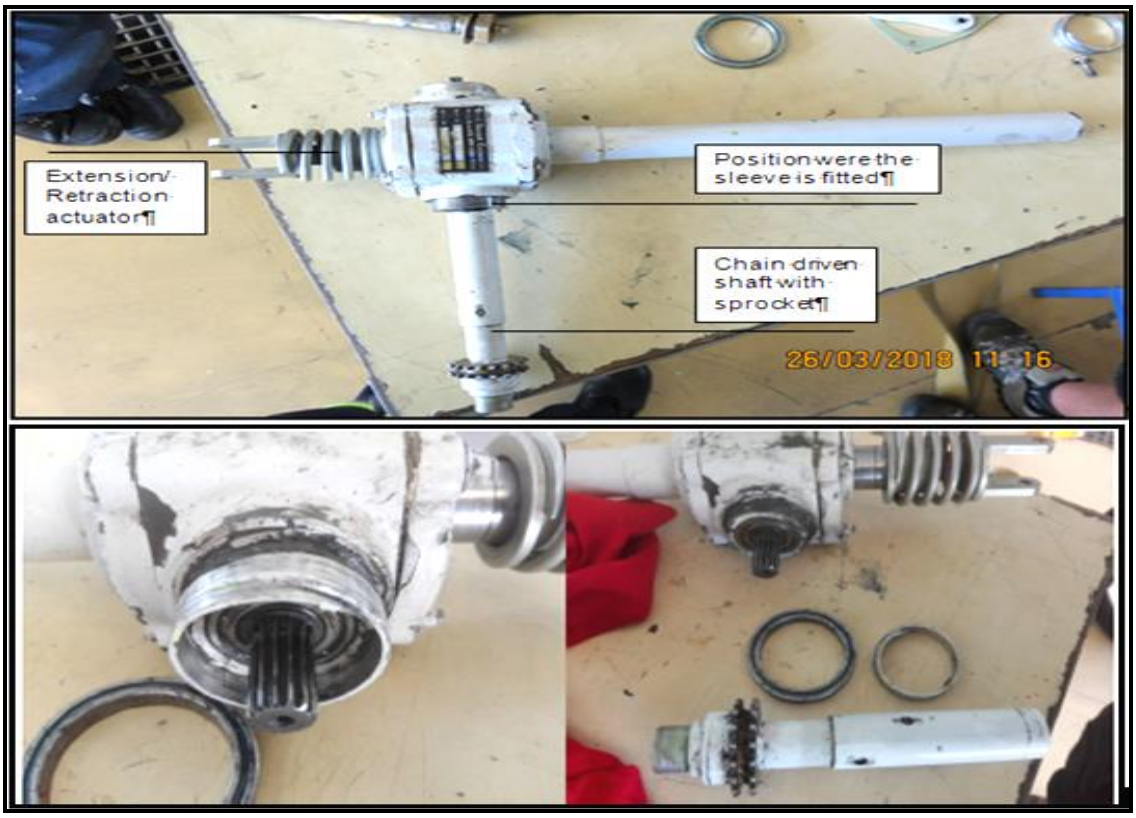

Figure 15: The actuator and damaged sleeve

1.16.6 The retraction/extension motor circuit breaker had popped out. According to the maintenance manual, if during an emergency landing, gear extension is activated and a retraction is executed without disengaging the section, the circuit breaker will pop out.

1.17 Organizational and Management Information

1.17.1 The aircraft was operated under provision of Part 91 of the CARs at the time of the incident.

1.17.2 According to the available information, the aircraft was maintained by a Regulator-approved AMO, which maintained the aircraft in accordance with the manufacture's prescribed procedures. The last on the AMO and issued with the AMO certificate on 21 August 2017 which was to expire on 31 August 2018.

1.18 Additional Information

1.18.1 None

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 Both crew members were qualified and accordingly licensed on the aircraft type. The PIC's license was renewed by the Regulator on the 09 June 2017. The 1st Officer's license was renewed by the Regulator on the 01 September 2017.

2.2 They both held valid medical certificates at the time of operating the aircraft. The PIC's medical certificate was issued on 30 November and was to expire on 30 November 2018. The 1st Officer's medical certificate was due to expire on 31 August 2018.

2.3 According to the available maintenance records, the aircraft was maintained by a Regulator-approved AMO in accordance with the aircraft manufacturer's prescribed procedures.

2.4 Following an MPI on 5 February 2018, the aircraft flew for approximately 9.9 hours uneventfully till the date of occurrence.

2.5 According to the maintenance manual with regard to the landing gear rigging on the nose gear retraction/extension chain, all necessary steps were followed during maintenance on the nose gear retraction chain.

2.6 It is possible that the sleeve came out during operation as there is nothing securing it as per the design. Its movement is only during extension or retraction of the landing gear. The inner sleeve might have egressed out of the bearing plate, allowing the actuator to have movement due to the chain tension exerted by the actuator driving torque shaft. The actuator came off from its assembly bracket position forcefully, which explains the loud noise the pilot said he heard from the nose wheel bay during landing gear extension.

This caused the misalignment of the actuator driving shaft sprocket. The chain then moved in the direction in which the force was favourable and came against the assembly bracket, causing an entrapment (jam). It could be that the sleeve gradually egressed over a period of time during operation.

2.7 The landing gear retraction/extension motor circuit breaker had popped out due to the emergency selection not being disengaged during attempts for both normal and emergency landing gear

extension, and landing gear retraction sequence was activated.

3. CONCLUSION

3.1 Findings

3.1.1 Both crew members were qualified, licensed and rated on the aircraft for the flight undertaken. They both held a valid medical certificate at the time of the incident flight.

3.1.2 The aircraft was properly maintained by a Regulator-approved AMO in accordance with manufacturer's approved maintenance procedures. The aircraft had a valid Certificate of Airworthiness.

3.1.3 The sleeve of the nose landing gear actuator came out of its position during operation. This allowed the actuator to move out of its assembly position, causing the misalignment of the driving shaft.

3.1.4 The driving chain was forced to jump out of the sprocket, and came against the airframe assembly bracket, causing a jam.

3.1.5 All necessary steps during maintenance of the landing gear were followed during maintenance procedure.

3.1.6 The pre-flight checks only involve checking the security of nose strut, brake hose, nose steering, tyre wheel well, doors and the landing lights.

3.2 Probable Cause/s

3.2.1 The nose gear failure to extend was attributed to the failure of the actuator sleeve which led to misalignment of the actuator drive shaft and chain resulting on a jamming of the chain and undercarriage system failure.

4. SAFETY RECOMMENDATIONS

4.1 None

5. APPENDICES

5.1 Appendix A: Nose landing gear retraction mechanism illustrated parts naming as per numbering

5.2 Appendix B: Nose landing gear actuator illustrated parts naming as per numbering

APPENDIX A

Nose landing gear retraction mechanism illustrated parts naming as per numbering:

Beechcraft Corporation

SUPER KING AIR B200 SERIES ILLUSTRATED PARTS CATALOG

FIG ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USABLE ON CODE	UNITS PER ASSY
13		LDG GR RETRACT MECHANISM, NOSE		
-5	50-820010-25	MECHANISM INSTL-NOSE LDG GR RETRACT	FE	RF
10	100-820015	. BRACKET-NOSE GEAR DRIVE CHAIN SPROCKET ATTACHING PARTS	FE	1
15	AN4-15	. BOLT	FE	2
20	50-820094	. BUSHING	FE	2
-25	AN960-416L	. WASHER ALTERNATE SPARE: NAS1149F0432P	FE	4
-25	NAS1149F0432P	. WASHER ALTERNATE SPARE: AN960-416L	FE	4
-30	130909N7	. NUT	FE	2
-35	MS24665-132	. PIN-COTTER	FE	2
		- - - - - - - * - - - - - - -		
40	S207-16A	. BOLT-BRACKET ADJUST	FE	1
-45	AN316-4	. NUT-BRACKET ADJUST BOLT LOCK	FE	1
-50	50-820070-4	. SPROCKET ASSY-STA 167.625	FE	2
55	B66	. . BEARING-SPROCKET	FE	1
60	50-820070-2	. . SPROCKET	FE	1
-65	50-820070-4	. SPROCKET ASSY-STA 158.00 ATTACHING PARTS	FE	2
70	AN4-15	. BOLT	FE	1
		- - - - - - - * - - - - - - -		
75	50-820094	. BUSHING	FE	1
80	50-400202	. SPACER ATTACHING PARTS	FE	1
-85	AN960-416	. WASHER ALTERNATE SPARE: NAS1149F0463P	FE	1
-85	NAS1149F0463P	. WASHER ALTERNATE SPARE: AN960-416	FE	1
-90	130909N7	. NUT	FE	1
-95	MS24665-132	. PIN-COTTER	FE	1
		- - - - - - - * - - - - - - -		
100	B66	. . BEARING-SPROCKET	FE	1
105	50-820070-2	. . SPROCKET	FE	1
110	50-820070-4	. SPROCKET ASSY ATTACHING PARTS	FE	2
115	AN4-16	. BOLT	FE	1
120	AN4-15	. BOLT	FE	1
-125	105740X-ZM0090	. BUSHING-UPPER SPROCKET ASSY	FE	1
-130	AN960-416L	. WASHER ALTERNATE SPARE: NAS1149F0432P	FE	2
-130	NAS1149F0432P	. WASHER ALTERNATE SPARE: AN960-416L	FE	2
-135	130909N7	. NUT	FE	1
-140	MS24665-132	. PIN-COTTER	FE	1
		- - - - - - - * - - - - - - -		

MISSING ITEM NO. NOT APPLICABLE

* ITEM NOT ILLUSTRATED

32-30-00-13
PAGE 1

FIG ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USABLE ON CODE	UNITS PER ASSY
13				
-445	NAS1149F0432P	. WASHER	FE	AR
		ALTERNATE SPARE:		
		AN960-416L		
		- - - - - - - * - - - - - - -		
450	50-820070-2	. . SPROCKET	FE	1
455	B66	. . BEARING	FE	1
-460	50-820220	. TIGHTENER ASSY-NOSE GEAR	FE	1
		ATTACHING PARTS		
-465	130909N32	. NUT	FE	1
		- - - - - - - * - - - - - - -		
470	50-820220-3	. . BRAZE ASSY	FE	1
475	S207-21A	. . BOLT	FE	1
-480	AN960-416	. . WASHER	FE	1
		ALTERNATE SPARE:		
		NAS1149F0463P		
-480	NAS1149F0463P	. . WASHER	FE	1
		ALTERNATE SPARE:		
		AN960-416		
-485	130909N32	. . NUT	FE	1
-490	50-820070-4	. SPROCKET ASSY	FE	1
		ATTACHING PARTS		
495	AN4-15	. BOLT	FE	1
500	50-820094	. BUSHING	FE	1
-505	AN960-416	. WASHER	FE	1
		ALTERNATE SPARE:		
		NAS1149F0463P		
-505	NAS1149F0463P	. WASHER	FE	1
		ALTERNATE SPARE:		
		AN960-416		
-510	130909N7	. NUT	FE	1
-515	MS24665-132	. PIN-COTTER	FE	1
		- - - - - - - * - - - - - - -		
520	50-820070-2	. . SPROCKET	FE	1
525	B66	. . BEARING	FE	1
530	102933-F4ZJ0968	. SPACER	FE	2
535	NAS427K18	. PIN	FE	2
-540	50-820140-9	. BEARING ASSY-ACTUATOR	FE	1
		DRIVE		
		ATTACHING PARTS		
545	130909B15	. BOLT	FE	4
-550	AN960-10	. WASHER	FE	4
		ALTERNATE SPARE:		
		NAS1149F0363P		
-550	NAS1149F0363P	. WASHER	FE	4
		ALTERNATE SPARE:		
		AN960-10		
-555	130909N29	. NUT	FE	4
		- - - - - - - * - - - - - - -		
560	50-820140-7	. . HOUSING-BEARING	FE	1
565	R12-ZZ	. . BEARING	FE	1
-570	90-820014-1	. DRIVE ASSY-NOSE GEAR	FE	1
		ACTUATOR		
575	99-820051-5	. . BRAZE ASSY	FE	1
580	50-820218-11	. . SHAFT ASSY	FE	1
585	130909B23	. . BOLT	FE	2

MISSING ITEM NO. NOT APPLICABLE

* ITEM NOT ILLUSTRATED

32-30-00-13

APPENDIX B

Nose landing gear actuator illustrated parts naming as per numbering:

Beechcraft Corporation

SUPER KING AIR B200 SERIES ILLUSTRATED PARTS CATALOG

FIG ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USABLE ON CODE	UNITS PER ASS'Y
19		NOSE LANDING GEAR ACTUATOR		
-5	50-820208-5	ACTUATOR ASS'Y-NOSE LANDING GEAR	FE	1
10	50-820254	. HOUSING ASS'Y-ACTUATOR SCREW FOR SPARES ORDER 90-820027-1	FE	1
10	98-820027-1	. GEAR SET SPARES REPLACEMENT FOR: 50-820254	FE	1
15	63X353	. SEAL-ACTUATOR	FE	1
20	50-810244-3	. HOUSING-NOSE LANDING GEAR ACTUATOR	FE	1
25	50-810168-3	. COVER-NOSE GEAR ACTUATOR TOP FOR SPARES ORDER: 50-810168-5	FE	1
25	50-810168-5	. COVER-NOSE GEAR ACTUATOR TOP SPARES REPLACEMENT FOR: 50-810168-3	FE	1
35	50-820226-3	. COVER-NOSE GEAR ACTUATOR BOTTOM ATTACHING PARTS	FE	1
40	AN3-27A/W	. BOLT	FE	4
-45	AN960-10	. WASHER ALTERNATE SPARE: NAS1149F0363P	FE	4
-45	NAS1149F0363P	. WASHER ALTERNATE SPARE: AN960-10	FE	4
-50	130909N29	. NUT - - - - - - - * - - - - - - -	FE	4
55	50-380043	. BEARING	FE	1
65	R18	. BEARING FOR SPARES ORDER: S11K	FE	1
65	S11K	. BEARING SPARES REPLACEMENT FOR: R18	FE	1
70	50-820243	. PINION MISCELLANEOUS DATA FOR SPARES ORDER 90-820027-1	FE	1
70	98-820027-1	. GEAR SET SPARES REPLACEMENT FOR: 50-820243	FE	1
75	50-380044	. BEARING-PINION INNER	FE	1
80	R-8-FF	. BEARING-PINION OUTER	FE	1
85	NAS51-50	. RING-SNAP	FE	1
90	MS20913-13	. PLUG	FE	1
95	AN6227-17	. PACKING-PREFORMED FOR SPARES ORDER: M83461/1-212	FE	1

MISSING ITEM NO. NOT APPLICABLE

* ITEM NOT ILLUSTRATED

32-30-00-19

FIG ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USABLE ON CODE	UNITS PER ASSY
19				
95	M83461/1-212	. PACKING SPARES REPLACEMENT FOR: AN6227-17	FE	1
100	90-820015-1	. NUT ASSY	FE	1
105	50-820227	. RETAINER	FE	1
110	50-820211	. CLEVIS-NOSE GEAR ACTUATOR ATTACHING PARTS	FE	1
115	102809-312-029	. PIN - - - - - - - * - - - - - - -	FE	1
120	50-820212	. SPRING	FE	1
125	50-810245	. SHIM-NOSE GEAR ACTUATOR	FE	1
-130	131052-1	. PLACARD-IDENTIFICATION FOR SPARES ORDER: 131050-7	FE	1
-130	131050-7	. PLACARD-IDENTIFICATION SPARES REPLACEMENT FOR: 131052-1	FE	1
		B0734-B0734,B0793-B0793,B0829-B0829,B0854-B0870, B0874-B0891,B0894-B0911,B0913-B1157,B1159-B1166, B1168-B1192,L0037-L0072,N0002-N0004,T0023-T0027, T0029-T0030	FE	