Aviation Investigation Final Report

Location:	Bishop, California	**Accident Number:**	LAX02TA299
Date & Time:	September 29, 2002, 08:54 Local	**Registration:**	N352SA
Aircraft:	Eurocopter AS350-B3	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	4 None
Flight Conducted Under:	Public aircraft		

Analysis

The helicopter was performing a hydraulic actuator check for the first flight of the day. The collective had been placed in the down position, the collective lock was engaged, and the rotor powered up to 100 percent flight idle. After depressing the hydraulic test switch, the pilot moved the cyclic fore and aft to confirm there was pressure remaining in the accumulators for a few control movements. The collective rose uncommanded and the helicopter moved forward in a nose down attitude. The main rotor struck the ground and the helicopter made two revolutions before rolling over onto its side, destroying both the main and tail rotor systems. A small fire ensued in the exhaust area, but was quickly extinguished. Examination of the collective locking mechanism (P/N 350A-27 3455-20 and P/N 350A-27 3107-26) found that it failed to hold the collective in the full down position due to wear on the locking tab. During servo accumulator checks, movement of the cyclic control after accumulator depletion caused the collective to move due to feedback in the control system. The locking device disengaged and the collective increased causing the aircraft to move.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the disengagement of the collective locking mechanism due to component wear.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: STANDING - ENGINE(S) OPERATING

Findings
1. (C) ROTORCRAFT FLIGHT CONTROL,COLLECTIVE CONTROL - WORN
2. (C) ROTORCRAFT FLIGHT CONTROL,COLLECTIVE CONTROL - UNLOCKED
3. (C) HYDRAULIC SYSTEM - NOT AVAILABLE

Occurrence #2: LOSS OF CONTROL - ON GROUND/WATER
Phase of Operation: STANDING - ENGINE(S) OPERATING

Findings
4. COLLECTIVE - INADVERTENT ACTIVATION

Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: STANDING - ENGINE(S) OPERATING

Findings
5. TERRAIN CONDITION - GROUND

Factual Information

On September 29, 2002, about 0854 Pacific daylight time, an Eurocopter AS350-B3, N352SA, collided with terrain during a premature liftoff while engaged in a pre-departure hydraulic flight control check at the Bishop, California, airport. The U.S. Forest Service was operating the helicopter as a public-use flight under the provisions of 14 CFR Part 91. The commercial pilot and three passengers were not injured; the helicopter sustained substantial damage. The cross-country flight was departing the Bishop airport for Bridgeport, California. Visual meteorological conditions prevailed, and an agency flight plan had been filed.

Forest Service officials reported that the helicopter was performing a hydraulic actuator check for the first flight of the day. The collective had been placed in the down and locked position and the rotor powered up to 100 percent flight idle. After depressing the hydraulic test switch, the pilot moved the cyclic fore and aft (pumped) to confirm there was remaining pressure for a few control movements. The collective rose uncommanded and the helicopter moved forward in a nose down attitude. The main rotor struck the ground and the helicopter made two revolutions before rolling over onto its side, destroying both the main and tail rotor systems. A small fire ensued in the exhaust area, but was quickly extinguished.

Examination of the collective locking mechanism was accomplished by Forest Service investigators. According to their report, the collective control lock mechanism (P/N 350A-27 3455-20 and P/N 350A-27 3107-26) failed to hold the collective in the full down position (due to wear) while performing before takeoff checks. During servo accumulator checks, movement of the cyclic control after accumulator depletion caused the collectiove to move (feedback). The locking device disengaged and the collective increased causing the aircraft to move.

Pilot Information

Certificate:	Commercial; Flight instructor; Private	**Age:**	27,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Helicopter; Instrument helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	June 5, 2002
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	February 11, 2002
Flight Time:	3000 hours (Total, all aircraft), 350 hours (Total, this make and model), 2900 hours (Pilot In Command, all aircraft), 210 hours (Last 90 days, all aircraft), 37 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Eurocopter	**Registration:**	N352SA
Model/Series:	AS350-B3	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	3348
Landing Gear Type:	Skid	**Seats:**	6
Date/Type of Last Inspection:	August 16, 2002 100 hour	**Certified Max Gross Wt.:**	4961 lbs
Time Since Last Inspection:	86 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	736 Hrs	**Engine Manufacturer:**	Turbomeca
ELT:	Installed, not activated	**Engine Model/Series:**	Arriel 1D1
Registered Owner:	Sun Air Aviation, LLC	**Rated Power:**	420 Horsepower
Operator:	US Dept of Agriculture, US Forest Service	**Operating Certificate(s) Held:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KBIH,4120 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	08:56 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	340°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.93 inches Hg	**Temperature/Dew Point:**	7°C / -1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Bishop, CA (BIH)	**Type of Flight Plan Filed:**	VFR
Destination:	Bridgeport, CA (O57)	**Type of Clearance:**	None
Departure Time:	08:58 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Bishop BIH	**Runway Surface Type:**	
Airport Elevation:	4120 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 None	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 None	**Latitude, Longitude:**	37.372776,-118.363609

Administrative Information

Investigator In Charge (IIC):	Petterson, George
Additional Participating Persons:	Russell Stone; Federal Aviation Administration; Reno, NV Jack Blackwell; U.S. Forest Service; Boise, ID
Original Publish Date:	June 8, 2005
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=55797