National Transportation Safety Board
Aviation Accident Final Report

Location:	Reno, NV	**Accident Number:**	WPR14LA040
Date & Time:	11/01/2013, 0940 PDT	**Registration:**	N20739
Aircraft:	MIKOYAN GUREVICH MIG 21 UM	**Aircraft Damage:**	Substantial
Defining Event:	Runway excursion	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot reported that, following a normal landing, he applied the brakes and that he then released the brakes as the airplane decelerated to allow for brake cooling. As the airplane passed the 4,000-foot-remaining sign, the pilot reapplied the brakes but noted no braking action. The airplane subsequently overran the departure end of the runway. Postaccident examination of the airplane revealed that the spring that allows the front brakes to engage a brake pawl was fractured, which resulted in the deactivation of the front brake pedals and the subsequent runway overrun.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of brake control due to the fracture of the front brake pawl engagement spring, which resulted in a runway overrun.

Findings

Aircraft	Master cylinder/brake valve - Failure (Cause)

Factual Information

On November 1, 2013, about 0940 Pacific daylight time, a Mikoyan Gurevich Mig 21 UM, N20739, was substantially damaged during a runway overrun at the Reno-Stead Airport (RTS), Reno, Nevada. The airplane was registered to Migs of Delaware LLC., Wilmington, Delaware, and operated by the pilot under the provisions of Title 14 Code of Federal Regulations Part 91. The commercial pilot, sole occupant of the airplane, sustained serious injuries. Visual meteorological conditions prevailed and no flight plan was filed for the local personal flight that originated from RTS at 0915.

In a written statement to the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), the pilot reported that following a normal landing on runway 14 (9,000-foot long and 150-foot wide asphalt runway), he initially applied braking. The pilot released the wheel brakes as the airplane decelerated to allow for cooling. As the airplane crossed the 4,000 foot remaining sign, he reapplied brakes with no braking action noted. He applied the emergency brake, however, did not immediately feel a response. The pilot shut down the engine and retracted the landing gear as the airplane approached the departure end of the runway. Subsequently, the airplane overran the departure end of the runway, traveled down an embankment, and came to rest upright. The pilot added that at the time the brakes failed, the airplane was too slow for an effective drag chute deployment.

Examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed that the fuselage and wings were structurally damaged. The inspector stated that the emergency brake handle and drag chute both remained in the stowed positions. The airplane was recovered to a secure location for further examination.

The inspector reported that the accident airplane brake system features control levers for the front seat (student or solo position) and rear seat (instructor position) that are stacked on a pivot point with only the rear seat brake levers physically actuating the pneumatic brake valve. The front seat lever engages the rear seat lever with a pawl. Spring tension holds the pawl in the engaged position, however, can be disengaged if the rear seat pilot elects to override the front seat pilot. The inspector reported that he coordinated with the pilot's mechanic to look at the airplane further; however, the mechanic disassembled the brake system prior to his arrival. The inspector stated that examination of the accident airplane revealed that a spring that holds the pawl in place and engaged was fractured and separated, which allowed the pawl to become disengaged. The disengaged pawl resulted in the deactivation of front brakes.

Review of the Pilot's Flight Operating Instructions for the airplane stated, in part, "....if upon depressing the braking lever, the aircraft fails to get braked or one of the wheels gets sharply braked, proceed as follows: (a) release the braking lever, immediately deploy the drag chute and retract the flaps." The instructions further state "...after deployment of the drag chute, shut down the engine and use the emergency braking system."

History of Flight

Landing-landing roll	Runway excursion (Defining event)

Pilot Information

Certificate:	Commercial	**Age:**	71
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without Waivers/Limitations	**Last Medical Exam:**	05/07/2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	05/05/2013
Flight Time:	2800 hours (Total, all aircraft), 400 hours (Total, this make and model), 2800 hours (Pilot In Command, all aircraft), 28 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	MIKOYAN GUREVICH	**Registration:**	N20739
Model/Series:	MIG 21 UM NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Experimental	**Serial Number:**	3171
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:	04/07/2013, AAIP	**Certified Max Gross Wt.:**	20994 lbs
Time Since Last Inspection:	6.1 Hours	**Engines:**	1 Turbo Jet
Airframe Total Time:	1827.2 Hours	**Engine Manufacturer:**	Tomanski
ELT:	Installed, not activated	**Engine Model/Series:**	R22F25300
Registered Owner:	MIGS OF DELAWARE LLC	**Rated Power:**	13613 lbs
Operator:	Joesph Gano	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	KRNO, 4400 ft msl	**Observation Time:**	1655 UTC
Distance from Accident Site:	11 Nautical Miles	**Condition of Light:**	Day
Direction from Accident Site:	157°	**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:	Clear	**Temperature/Dew Point:**	5°C / -1°C
Lowest Ceiling:	None	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	Calm	**Visibility (RVR):**	
Altimeter Setting:	30.32 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Reno, NV (RTS)	**Type of Flight Plan Filed:**	None
Destination:	Reno, NV (RTS)	**Type of Clearance:**	None
Departure Time:	0915 PDT	**Type of Airspace:**	

Airport Information

Airport:	RENO/STEAD (RTS)	**Runway Surface Type:**	Asphalt
Airport Elevation:	5050 ft	**Runway Surface Condition:**	Dry
Runway Used:	14	**IFR Approach:**	None
Runway Length/Width:	9000 ft / 150 ft	**VFR Approach/Landing:**	Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious		

Administrative Information

Investigator In Charge (IIC):	Joshua Cawthra	**Adopted Date:**	09/29/2014
Additional Participating Persons:	Bill Kunder; Federal Aviation Administration; Reno, NV		
Publish Date:	09/29/2014		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=88374		

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