Aviation Investigation Final Report

Location:	OURAY, Colorado	**Accident Number:**	DEN01LA141
Date & Time:	August 7, 2001, 18:30 Local	**Registration:**	N724BF
Aircraft:	Enstrom 280FX	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Prior to landing the helicopter at an altitude of about 12,000 feet mean sea level, the pilot completed a "power check," and at that time, the engine was able to develop 39 inches of manifold pressure. While on short final, the pilot added power, however, the engine could only achieve 31 inches of manifold pressure. The pilot then executed a forced landing to a grassy area at the top of a slope. Approximately 10 feet agl, the low rotor rpm horn sounded, and the pilot "cushioned the landing with little power." Subsequently, the helicopter slid off the slope, rolled over, and came to rest on its right side. The helicopter was recovered and examined by a helicopter mechanic and the pilot. During the examination, the mechanic found that "the wastegate linkage sheath was in its detent." However, "the sheath took two fingers with very light pressure to pull it out of its detent." The mechanic attributed the ease with which he was able to pull the sheath out of the detent to "the ball plunger on the wastegate linkage not being torqued." In the mechanic's opinion, "between the light torque on the ball plunger and the heat in the engine compartment, the sheath for the wastegate linkage would at times slide on the inside shaft. Without collective, throttle, and wastegate rigging working together, this would greatly affect power or lack of power."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the partial loss of engine power due to the slippage of the wastegate linkage as a result of the plunger on the linkage being undertorqued by an unknown person. A contributing factor was

the lack of suitable terrain for the forced landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - MECH FAILURE/MALF
Phase of Operation: APPROACH

Findings
1. (C) EXHAUST SYSTEM,WASTEGATE - UNDERTORQUED
2. (C) MAINTENANCE,INSTALLATION - IMPROPER - UNKNOWN
3. (C) EXHAUST SYSTEM,WASTEGATE - SLIPPED

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: ROLL OVER
Phase of Operation: LANDING

Findings
4. (F) TERRAIN CONDITION - NONE SUITABLE
5. TERRAIN CONDITION - DROP-OFF/DESCENDING EMBANKMENT

Factual Information

On August 7, 2001, at 1830 mountain daylight time, an Enstrom 280FX single-engine helicopter, N724BF, sustained substantial damage when it rolled over on its side during a forced landing approximately 7 miles west of Ouray, Colorado. The private pilot and his passenger were not injured. The helicopter was registered to Young's Manufacturing, Inc., of Montrose, Colorado, and operated by the pilot. Visual meteorological conditions prevailed, and a flight plan was not filed for the 14 Code of Federal Regulations Part 91 personal flight. The local flight departed a private helipad near Montrose at 1740.

In a written statement, the pilot reported that he attempted a "normal to flat approach to land." Prior to the landing, the pilot completed a power check, and at that time, the engine was able to develop 39 inches of manifold pressure. While on short final, the pilot added power, however, the engine "could only achieve 31 [inches of manifold pressure]." The pilot then executed a forced landing to a grassy area at the top of a slope. Approximately 10 feet agl, the low rotor rpm horn sounded, and the pilot "cushioned the landing with little power." Subsequently, the helicopter slid off the slope, rolled over, and came to rest on its right side. The pilot stated that the elevation at the accident site was about 12,000 feet mean sea level.

The helicopter was recovered and examined by a helicopter mechanic and the pilot. The mechanic reported that, in a conversation with another pilot who flew the helicopter a few days prior to the accident, that pilot stated that "the helicopter performed fine except for a problem they had with the wastegate assembly." During the examination, the mechanic found that "the wastegate linkage sheath was in its detent." However, "the sheath took two fingers with very light pressure to pull it out of its detent." The mechanic attributed the ease with which he was able to pull the sheath out of the detent to "the ball plunger on the wastegate linkage not being torqued." In the mechanic's opinion, "between the light torque on the ball plunger and the heat in the engine compartment, the sheath for the wastegate linkage would at times slide on the inside shaft. Without collective, throttle, and wastegate rigging working together, this would greatly affect power or lack of power."

Pilot Information

Certificate:	Commercial; Private	**Age:**	38,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	January 18, 2000
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	April 3, 2001
Flight Time:	1678 hours (Total, all aircraft), 22 hours (Total, this make and model), 1536 hours (Pilot In Command, all aircraft), 86 hours (Last 90 days, all aircraft), 58 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Enstrom	**Registration:**	N724BF
Model/Series:	280FX	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	2049
Landing Gear Type:	Skid	**Seats:**	3
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	2600 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	648.3 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Not installed	**Engine Model/Series:**	HIO-360-F1AD
Registered Owner:	On file	**Rated Power:**	225 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	8 miles
Lowest Ceiling:	Overcast / 6000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.37 inches Hg	**Temperature/Dew Point:**	6°C
Precipitation and Obscuration:	Light - None - Drizzle		
Departure Point:	Montrose, CO (MTJ)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	17:40 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	38.030239,-107.640937(est)

Administrative Information

Investigator In Charge (IIC):	Wiemeyer, Norman
Additional Participating Persons:	James E Gilchrist; FAA FSDO; Salt Lake City , UT
Original Publish Date:	July 25, 2002
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=52965