Aviation Investigation Final Report

Location:	Honolulu, Hawaii	**Accident Number:**	ANC24LA077
Date & Time:	August 18, 2024, 16:00 Local	**Registration:**	N740RH
Aircraft:	Robinson R44	**Aircraft Damage:**	Substantial
Defining Event:	Sys/Comp malf/fail (non-power)	**Injuries:**	1 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled - Sightseeing		

Analysis

The pilot reported that, before boarding passengers, she started the engine, engaged the clutch and, as the main rotor system began to engage, she felt and saw the left pedal deflect full forward without any control input. The pilot immediately shut down the engine, stopped the rotors, and exited the helicopter to inspect the tail rotor assembly. The tail rotor push-pull tube was found bent and severed aft of the tail rotor gear box, near the bell crank assembly.

A postaccident examination revealed a bolt missing from the flex plate assembly, just forward of the tail rotor gearbox. The bolt was found in the tailboom just below the flex plate assembly and exhibited significant circumferential wear marks. A second bolt from the flex plate assembly exhibited similar wear; the two other bolts in the assembly exhibited no wear and were firmly torqued to the flex plate assembly. Black dust was observed on the flex plate and associated hardware, indicative of fretting.

The helicopter went through a major overhaul in May of 2024, at which time the tail rotor drive shaft, aft flex plate assembly, and tail rotor push-pull tube were installed. Since May of 2024 the accident helicopter had flown about 338 hours. The most recent 100-hour inspection was completed on August 1, 2024, by the operator. The 100-hour inspection requires the operator to inspect the tail rotor flex plate assembly.

A review of the airframe maintenance logbooks showed evidence of compliance with the helicopter manufacturer's 100-hour inspection to include the flex plate assembly. The circumferential wear and black dust present during the postaccident examination indicate that the bolts were likely loose during the 100-hour inspection; however, no evidence of fretting or looseness was documented.

It is likely that, over time, two of the bolts in the flex plate assembly became loose during operation because they were not properly torqued during installation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A failure of the flex plate yoke flange assembly due to incorrectly torqued bolts. Contributing was the maintenance personnel's inadequate inspection of the tail rotor flex plate assembly.

Findings

Aircraft	(general) - Incorrect service/maintenance
Personnel issues	Scheduled/routine maintenance - Maintenance personnel

Factual Information

History of Flight

Prior to flight	Sys/Comp malf/fail (non-power) (Defining event)

On August 18, 2024, about 1600 Hawaii-Aleutian standard time, a Robinson R44 helicopter, N740RH, sustained substantial damage when it was involved in a pre-takeoff accident near Honolulu, Hawaii. The pilot was uninjured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 135 sightseeing flight.

The pilot had completed four flights without incident and was starting the helicopter for the fifth flight when the accident occurred. The pilot reported she noticed an unusual vibration in the pedals as she was starting the helicopter, and the left pedal deflected forward to the stop and could not be recentered. The pilot immediately cut off fuel to the engine and disengaged the clutch without further incident. The pilot exited the helicopter and noticed the tail rotor push-pull tube was bent and severed aft of the tail rotor gear box near the bell crank assembly.

According to the Robinson Illustrated Parts Manual, the attachment bolts holding the flex plate and yoke flange assembly together consisted of (2) NAS 6604-4 bolts, (2) NAS 6604-7 bolts, (8) NAS 1149F0432P (AN960-416L) washers, (4) D210-4 nuts, and (4) B330-13 palnuts.

A postaccident examination of the helicopter revealed that 1 of the NAS 6604-4 bolts connecting the flex plate to the yoke flange of the tail rotor gearbox was missing. The bolt and associated washers were located at the bottom of the tailboom below the flex plate coupling assembly. The NAS 6604-4 bolt matched witness marks found on the fractured tail rotor push-pull tube. Both NAS 6604-4 bolts exhibited circumferential wear marks on the bolt shaft; the bolt threads were intact. The flex plate assembly exhibited deformation where the NAS 6604-4 bolts were attached; however, the NAS 6604-7 bolts and their attachment points on the flex plate exhibited no wear or deformation. Torque stripe was observed on the NAS 6604-7 bolts and evidence of torque stripe was noted on the 6604-4 bolts.

The accident helicopter had gone through a major overhaul in May of 2024 and had flown about 338 hours since overhaul. A 100-hour inspection was completed on August 1, 2024. The 100-hour inspection requires the operator to inspect the tail rotor flex plate assembly.

The mechanic who signed the logbook entry for the overhaul reported that he inspected the bolts connecting the tail rotor flex plate and yoke flange assembly by hand. He reported that all four bolts, their respective washers and palnuts were torqued correctly and had torque stripe.

A review of the airframe maintenance logbooks showed evidence of compliance with the helicopter manufacturer's 100-hour inspection; however, no evidence of fretting or looseness was documented.

The Robinson R44 Maintenance Manual 100-hour procedure for the flex plate assemblies requires maintenance personnel to:

“Inspect condition. Verify no obvious damage. If fretting is detected, replace the flex plate. Verify bonded washers are installed on both sides of flex plate arm. Verify security and operating clearance.”

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	23,Female
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	3-point
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Helicopter; Instrument helicopter	**Toxicology Performed:**	
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	October 5, 2023
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 10, 2023
Flight Time:	1532 hours (Total, all aircraft), 791 hours (Total, this make and model), 1453 hours (Pilot In Command, all aircraft), 256 hours (Last 90 days, all aircraft), 84 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Robinson	**Registration:**	N740RH
Model/Series:	R44 II	**Aircraft Category:**	Helicopter
Year of Manufacture:	2018	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	2559
Landing Gear Type:		**Seats:**	4
Date/Type of Last Inspection:	August 1, 2024 100 hour	**Certified Max Gross Wt.:**	2400 lbs
Time Since Last Inspection:	67.9 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4736.6 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Not installed	**Engine Model/Series:**	O-540-F1B5
Registered Owner:	United Helicopter Leasing, Inc	**Rated Power:**	235 Horsepower
Operator:	Novictor Aviation LLC	**Operating Certificate(s) Held:**	Commuter air carrier (135)
Operator Does Business As:	Rainbow Helicopters	**Operator Designator Code:**	2NVA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HNL,13 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	16:00 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Few / 3900 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots / 20 knots	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	20°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	29.4°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Honolulu, HI	**Type of Flight Plan Filed:**	None
Destination:	Honolulu, HI	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class B

Airport Information

Airport:	Honolulu HNL	**Runway Surface Type:**	
Airport Elevation:	13 ft msl	**Runway Surface Condition:**	Dry
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:	N/A	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	21.315266,-157.9219

Administrative Information

Investigator In Charge (IIC):	Joyce, Stacia
Additional Participating Persons:	Jason Wyatt; Federal Aviation Administration ; Honolulu, HI
Original Publish Date:	July 23, 2025
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=194946