



## National Transportation Safety Board Aviation Accident Factual Report

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<b>Location:</b>	Chandler, AZ	<b>Accident Number:</b>	LAX02LA121
<b>Date &amp; Time:</b>	04/01/2002, 0955 MST	<b>Registration:</b>	N21901
<b>Aircraft:</b>	Rotorway Exec 165F	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	1 Serious, 1 Minor

**Flight Conducted Under:** Part 91: General Aviation - Instructional

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On April 1, 2002, at 0955 mountain standard time, a Rotorway Exec 165F helicopter, N21901, collided with the ground following a loss of tail rotor drive during a steep approach near Chandler, Arizona. The helicopter, owned and operated by Rotorway International under 14 CFR Part 91, was on a local area instructional flight. The helicopter sustained substantial damage. The commercial pilot/flight instructor sustained serious injuries, and an airline transport pilot student sustained minor injuries. Visual meteorological conditions prevailed and no flight plan was filed. The flight departed from Stellar Airpark, Chandler, about 0900.

The CFI reported that after performing various maneuvers, he and the student began traffic patterns to a landing zone (LZ). On short final, approximately 40 feet, and 40 miles per hour (mph), the helicopter yawed left slowly. When the helicopter had reached a 45-degree left yaw, the CFI took the controls. As the helicopter approached a 90-degree left yaw, the CFI had applied full right pedal. Simultaneously, he lowered the collective and reduced power. The helicopter rotated 360 degrees about 3 times before impact. The helicopter impacted the ground, collapsing the right skid, and coming to rest on its right side.

The helicopter was examined at Rotorway International in Chandler under the auspices of the Federal Aviation Administration (FAA) inspector. He reported that the tail rotor drive system uses three belts, interconnected via pulleys at various points within the tail boom, to drive the tail rotor. The forward and aft belts and pulleys were normal. The intermediate belt was found shredded, burned, and separated. The aft end of the intermediate belt was positioned correctly on the rear pulley; however, the forward end was around the wrong pulley, the one meant for the forward belt, which induced a large misalignment of the belt and consequent rub between it and the pulley side. All pulleys were installed with specified tightness and with fore/aft play as stated in the maintenance manual. The engine, clutch, drive belt system, and transmission were found in working order.

Maintenance records for the helicopter indicated that the belts were replaced twice in the past 8 months. The first time was in August 2001, for a heavy maintenance rebuild. The second time was in November 2001 following a tail rotor strike. The belts had about 200 hours operating time since their last replacement in November.

On April 4, 2002, Rotorway International issued a Mandatory Compliance Bulletin M-20 that required immediate inspection to verify proper routing of tail rotor drive belts through the tail boom. Any belt not properly routed into the correct idler pulley groove required immediate replacement.

### Flight Instructor Information

<b>Certificate:</b>	Flight Instructor; Commercial	<b>Age:</b>	47, Male
<b>Airplane Rating(s):</b>	Single-engine Land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Helicopter	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Helicopter	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	06/26/2001
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	04/30/2000
<b>Flight Time:</b>	1600 hours (Total, all aircraft), 800 hours (Total, this make and model), 1500 hours (Pilot In Command, all aircraft)		

### Student Pilot Information

<b>Certificate:</b>	Airline Transport; Flight Instructor; Commercial; Flight Engineer	<b>Age:</b>	55, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land; Single-engine Sea	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	12/18/2001
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	11/17/2001
<b>Flight Time:</b>	17000 hours (Total, all aircraft), 1 hours (Total, this make and model), 13000 hours (Pilot In Command, all aircraft), 180 hours (Last 90 days, all aircraft), 60 hours (Last 30 days, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Rotorway	<b>Registration:</b>	N21901
<b>Model/Series:</b>	Exec 165F	<b>Aircraft Category:</b>	Helicopter
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Experimental	<b>Serial Number:</b>	6035
<b>Landing Gear Type:</b>	Skid	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	03/18/2002, Continuous Airworthiness	<b>Certified Max Gross Wt.:</b>	1500 lbs
<b>Time Since Last Inspection:</b>	12 Hours	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	1776 Hours as of last inspection	<b>Engine Manufacturer:</b>	Rotorway
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	162F
<b>Registered Owner:</b>	Cobb International, Inc.	<b>Rated Power:</b>	150 hp
<b>Operator:</b>	Cobb International, Inc.	<b>Operating Certificate(s) Held:</b>	None
<b>Operator Does Business As:</b>	Rotorway International	<b>Operator Designator Code:</b>	

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual Conditions	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KCHD, 1243 ft msl	<b>Distance from Accident Site:</b>	8 Nautical Miles
<b>Observation Time:</b>	0947 MST	<b>Direction from Accident Site:</b>	60°
<b>Lowest Cloud Condition:</b>	Scattered / 20000 ft agl	<b>Visibility</b>	35 Miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	/	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.87 inches Hg	<b>Temperature/Dew Point:</b>	23° C / 1° C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Chandler, AZ (P19)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>		<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	0900 TL	<b>Type of Airspace:</b>	Class E

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Serious, 1 Minor	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	N/A	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Serious, 1 Minor	<b>Latitude, Longitude:</b>	33.269167, -111.811111

## Administrative Information

<b>Investigator In Charge (IIC):</b>	JEFF RICH
<b>Additional Participating Persons:</b>	John Eller; Federal Aviation Inspector; Scottsdale, AZ
<b>Investigation Docket:</b>	NTSB accident and incident docket serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .