Aviation Investigation Final Report

Location:	Modesto, California	**Accident Number:**	LAX06LA229
Date & Time:	July 11, 2006, 11:33 Local	**Registration:**	N992PC
Aircraft:	Velocity 173/RG-XL	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The landing gear collapsed during a touch-and-go landing. The pilot/builder explained that the airplane ballooned after initial touchdown due to too much elevator trim. The airplane then landed "very hard" farther down the runway. The landing gear collapsed, and the rudders sustained substantial damage after contacting the runway. The pilot/builder conducted maintenance on his airplane, and believed that he had set the landing gear extension/retraction cables too tight. Coupled with the hard landing, this caused the main gear over-center linkage to release from the over-center position.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's misjudged flare and improper recovery from a bounced landing, which resulted in a hard landing and landing gear collapse. A contributing factor was the pilot/builder's inadequate adjustment of the landing gear cable tension.

Findings

Occurrence #1: HARD LANDING
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
1. (C) FLARE - MISJUDGED - PILOT IN COMMAND
2. (C) RECOVERY FROM BOUNCED LANDING - INADEQUATE - PILOT IN COMMAND

Occurrence #2: COMPLETE GEAR COLLAPSED
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
3. (F) LANDING GEAR,GEAR LOCKING MECHANISM - UNLOCKED
4. (F) MAINTENANCE,SERVICE OF AIRCRAFT/EQUIPMENT - INADEQUATE - OWNER/PILOT MECHANIC
5. LANDING GEAR - COLLAPSED

Factual Information

On July 11, 2006, about 1133 Pacific daylight time, an experimental Velocity 173/RG-XL, N992PC, had a landing gear collapse during a hard landing at Modesto City Airport, Modesto, California. The pilot/owner/builder was operating the airplane under the provisions of 14 CFR Part 91. The private pilot, the sole occupant, was not injured; the airplane sustained substantial damage. The local personal flight departed Modesto about 1125. Visual meteorological conditions prevailed, and no flight plan had been filed.

The pilot planned to do a touch-and-go landing on 28L. He stated that the airplane ballooned after initial touchdown due to too much elevator trim. It began to fly again at approximately 57 miles per hour, which was under the stall speed of 63 miles per hour. The airplane then landed "very hard" farther down the runway. The gear collapsed; the rudders contacted the runway, and sustained substantial damage.

The pilot reported that the airplane had a total airframe time of 89 hours. It had an annual inspection on November 15, 2005, 9 hours prior to the accident. He said that a hydraulic actuator drives a set of cables, which move the landing gear extension/retraction mechanism. The cables attach to the main gear struts. The cables provide the force to extend the locking mechanism to the over-center position. The pilot/builder does the maintenance on the airplane, and had adjusted the cable tension several times. He surmised that he had the landing gear cables set too tight. Coupled with the hard landing, he felt that this caused the main gear over-center linkage to release from the over-center position.

Pilot Information

Certificate:	Private	**Age:**	67,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
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 3 With waivers/limitations	**Last FAA Medical Exam:**	June 1, 2005
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1140 hours (Total, all aircraft), 89 hours (Total, this make and model), 1039 hours (Pilot In Command, all aircraft), 7 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Velocity	**Registration:**	N992PC
Model/Series:	173/RG-XL	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	3RX045
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	November 1, 2005 Annual	**Certified Max Gross Wt.:**	2700 lbs
Time Since Last Inspection:	9 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	89 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-540-C
Registered Owner:	On file	**Rated Power:**	260 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:	MOD,97 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	10:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	320°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	31°C / 12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Modesto, CA (MOD)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	VFR
Departure Time:	11:25 Local	**Type of Airspace:**	

Airport Information

Airport:	Modesto City MOD	**Runway Surface Type:**	Asphalt
Airport Elevation:	97 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	28L	**IFR Approach:**	None
Runway Length/Width:	3459 ft / 100 ft	**VFR Approach/Landing:**	Touch and go

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	37.631942,-120.957496

Administrative Information

Investigator In Charge (IIC):	Plagens, Howard
Additional Participating Persons:	Jim Henry; Federal Aviation Administration ; Fresno, CA
Original Publish Date:	November 29, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=64118