Date of Accident:	November 10, 2013
Location:	Owasso, OK
NTSB File No.:	CEN14FA046
Aircraft:	Mitsubishi MU-2B-25
Registration No.:	N856JT
Serial No.:	306
Operator:	as per the FAA registry: Anasazi Winds LLC 6585 S Yale Ave STE 437 Tulsa, OK 74136
Written by:	[redacted]
Date:	January 8, 2014

Contents:

ACCIDENT SYNOPSIS

According to the NTSB preliminary report, the aircraft, N856JT, was cleared to land on runway 18L at Tulsa, and the pilot was instructed to reduce his speed to 150 knots. The pilot acknowledged the clearance and speed reduction. Radar showed the airplane on a straight-in approach to runway 18L. After the plane passed the outer marker, the plane began a left turn. The ATC tower asked the pilot about the deviation, and the pilot reported he had a control problem. The left turn continued, and the controller then cleared the pilot to maneuver to the west and asked if he needed assistance. The pilot informed the controller that the left engine was shut down. The controller then declared an emergency for the pilot and asked about the number of souls on-board the plane and fuel remaining. No further communications were received. Radar showed the plane complete a 360 degree left turn near the runway 18L outer marker at 1100 feet and then was lost.

Aircraft Damage: Destroyed
Injuries: One on board, One fatal

SUMMARY AND ANALYSIS OF FINDINGS

The left propeller had mild impact damage, one blade was bent. The propeller was received in the feather position. The propeller was placed on a test stand and shop air was applied. The propeller moved from feather to normal operating ranges and back on the start locks. Normal operation was observed. Several impression marks indicated that propeller was in feather at the time of impact.

The right propeller had two propeller blade tips missing and one curled under with tears and gouges in the blade. The link arms were pulled from the clamps. The propeller was placed on a test stand and shop air was applied. Even though the blades were disconnected, the piston moved from feather to normal operating ranges and back on the start locks. Normal operation was observed.

CONCLUSIONS

The left propeller was in feather at the time of impact. The right propeller was in the normal operating range which is indicative of power on.

There were no discrepancies noted that would preclude normal operation. All damage was consistent with impact damage.

PROPELLER TEARDOWN REPORT

Date of Investigation: December 11, 2013

Location: Ottosen Propellers, PHX

Propeller Model: HC-B3TN-5M with 10178-11 blades.

Representatives: [redacted]

General Comments:

This type propeller is a 3-bladed single acting, hydraulically operated, constant speed model with feathering and reversing capability. Oil pressure from the propeller governor is used to move the blades to the low pitch (blade angle) direction. Blade mounted counterweights and a feathering spring actuate the blades towards the high pitch/feather direction in the absence of governor oil pressure. The propeller incorporates a start lock mechanism that holds the blades at a low blade angle during engine start. The blades are of aluminum construction. The hub and blade clamps are steel. Propeller rotation is clockwise as viewed from the rear.

Installation Data: (Data reference the 30-inch station)

Reverse Pitch:	-6.5 ± 0.5 degrees
Low Pitch:	12.0± F.I.
Start Lock:	2.5 ± 0.2 degrees
Feather:	87.0± 0.5 degrees

Service History:

	S/N	Date of manufacture	TTSN	TSO
Left Hub	BUA19862	April 1997	Unknown	Unknown
Blades	J50061	August 2000	Unknown	Unknown
	J50062	August 2000	Unknown	Unknown
	J50063	August 2000	Unknown	Unknown
Right Hub	BUA25609	March 2002	Unknown	Unknown
Blades	J48377	July 2000	Unknown	Unknown
	J48378	July 2000	Unknown	Unknown
	J48376	July 2000	Unknown	Unknown

Position: **LEFT**

Hub Serial Number: BUA19862 **Factory No.:** A9234A

Blade Model: T10178NS-11R

S/N # 1: J50061
S/N # 2: J50062
S/N # 3: J50062

Blade Orientation:

1-2-3-4 clockwise as viewed from the rear of the propeller. The hub serial number was between the **__L3_____** and # **___L1____** blades.

"As Received" Condition:

See pictures on page 5.

The propeller had mild damage, the L3 blade was slightly bent aft at midblade, otherwise, the propeller was intact and unremarkable. The spinner dome was missing. The propeller was in the feather position when received.

Spinner Dome:

The spinner dome was missing; it was removed by the NTSB at the accident site and not returned with the propeller.

Photo #1, propeller as received.

Photo #2, propeller as received.

Spinner Bulkhead:

The spinner bulkhead had some slight bending around the edge, otherwise, it was intact and unremarkable.

Propeller Cycling:

The propeller was connected to a test stand and shop air was applied. The propeller cycled normally to and from the feather position and onto the start locks.

Engine/Propeller Mounting:

The engine/propeller mounting was intact and unremarkable.

Blade/Clamp Rotation/Slippage:

There was no blade/clamp rotation or slippage.

Pitch Stops:

Reverse Pitch Stop: The reverse pitch stops were intact and unremarkable.

Feather Stop: The feather stop was intact and unremarkable.

Start Lock: The start locks were intact and unremarkable.

Piston:

The piston was intact and unremarkable.

Link Arms:

The link arms were intact and unremarkable.

Cylinder:

The cylinder was intact and unremarkable.

Feathering Spring Assembly:

The feathering spring was intact and unremarkable.

Pitch Change Rod:

The pitch change rod was intact and unremarkable.

Clamps and Counterweights:

The clamps and counterweights were intact and unremarkable.

Clamp serial numbers:
1: EG7356
2: EG7663
3: EG7453

Hub Unit:

The mounting flange was intact and unremarkable.

Cylinder attachment was intact and unremarkable.

Impression marks from blade butts: The L3 hub butt has a small impression mark from the test number on the blade at the 7 o'clock position. It also has a small impression at the 3 o'clock position. The L1 and L2 had a slight impression mark at the 3 o'clock position. The marks are indicative of the propeller being in the feather position at impact.

Blades:

See pictures on page 8 and 9.

Blade # 1
paint, camber side - intact and unremarkable.
paint, flat side - intact and unremarkable.
bend - none.
twist - none.
lead edge damage - none.
trail edge damage - none.
butt impression - slight mark at the 9 o'clock position.

Blade # 2
paint, camber side - intact and unremarkable.
paint, flat side - intact and unremarkable.
bend - none.
twist - none.
lead edge damage - none.

trail edge damage - none.
butt impression - slight mark at the 9 o'clock position.

Blade # 3
paint, camber side - intact with some small knicks and scratches.
paint, flat side - intact with some small knicks and scratches.
bend - bent aft at midblade.
twist - none.
lead edge damage - none.
trail edge damage - none.
butt impression - none.

Photo #3, left propeller blades

Photo #4, left propeller blades.

Position: **RIGHT**

Hub Serial Number: BUA25609 **Factory No.:** C2554A

Blade Model: T10178NS-11R

S/N # 1: J48377
S/N # 2: J48378
S/N # 3: J48376

Blade Orientation:

1-2-3-4 clockwise as viewed from the rear of the propeller. The hub serial number was between the **___R2____** and **___R3____** blades.

"As Received" Condition:

See pictures on page 10.

The R1 and R3 blade tips were torn off. The R2 blade had gouges missing and the tip was curled under. The R2 and R3 blades were bent over 100° forward. The

spinner dome was missing. All three link arms were disconnected from the blades clamps.

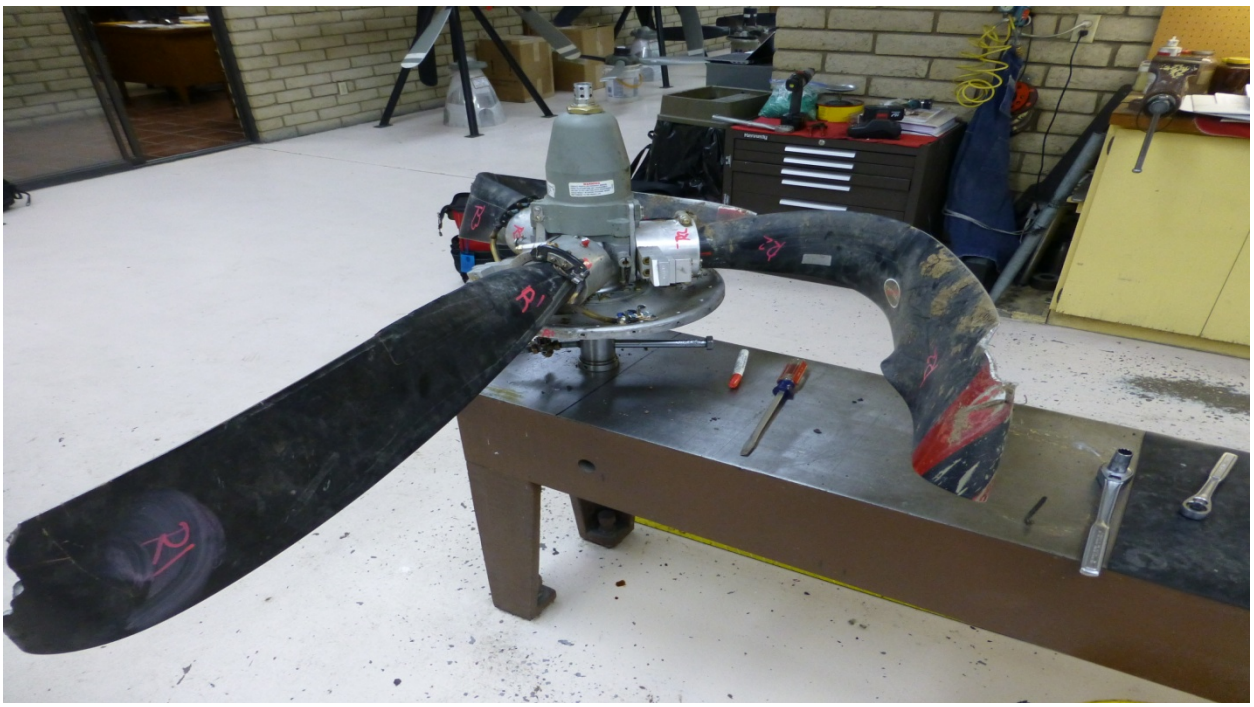

Photo #5, propeller as received.

Photo #6, propeller as received.

Spinner Dome:

The spinner dome was missing. The NTSB removed the spinner dome at the accident site and was not returned with the propeller.

Spinner Bulkhead:

The spinner bulkhead was intact and unremarkable.

Propeller Cycling:

The propeller was connected to a test stand and shop air was applied. Even though the link arms were disconnected at the blade clamps the piston still moved normally to and from the feather position and onto the start locks.

Engine/Propeller Mounting:

The engine/propeller mounting was intact and unremarkable.

Blade/Clamp Rotation/Slippage:

There was no blade/clamp rotation or slippage.

Pitch Stops:

Reverse Pitch Stop: The reverse pitch stops were intact and unremarkable.

Feather Stop: The feather stop was intact and unremarkable.

Start Lock: The start locks were intact and unremarkable.

Piston:

The piston was intact and unremarkable.

Link Arms:

The link arms were intact however all three arms had elongated holes from being pull off the clamps during impact.

Cylinder:

The cylinder was intact and unremarkable.

Feathering Spring Assembly:

The feathering spring was intact and unremarkable.

Pitch Change Rod:

The pitch change rod was intact and unremarkable.

Clamps and Counterweights:

The clamps and counterweights were intact and unremarkable.

Clamp serial numbers:
1: EK2709
2: EK2730
3: EK2639

Hub Unit:

The mounting flange was intact and unremarkable.

Cylinder attachment was intact and unremarkable.

There were no impression marks from blade butts.

Blades:

See pictures on page 13 and 14.

Blade # 1
paint, camber side - intact and unremarkable.
paint, flat side - intact and unremarkable.
bend - tip missing, bend forward towards tip.
twist - none, tip missing.
lead edge damage - some thermal damage.
trail edge damage - none.
butt impression - impression from raised surface of hub at 9 o'clock.

Blade # 2
paint, camber side - intact and unremarkable.
paint, flat side - intact and unremarkable.
bend - bent forward 90° at midblade, tip curled under.

twist - none
lead edge damage - tip torn and gouges, curled under.
trail edge damage - bends and tip curled under.
butt impression - impression from raised surface 360°.

Blade # 3
paint, camber side - intact and unremarkable.
paint, flat side - intact and unremarkable.
bend - bent forward 90° at midblade.
twist - none.
lead edge damage - none, tip missing.
trail edge damage - none, tip missing.
butt impression - impression at the 3 o'clock.

Photo #7, right propeller blades.

Photo #8, right propeller blades.

PHOTOGRAPHIC SUMMARY

NOTE: The following digital photographs are original and unedited and available on compact disc. The numbering sequence may not be chronological as some may have been deleted if out-of-focus, too dark, redundant, etc. Photos used in the text of this report are taken from photos on this list but may have been adjusted from the original. Modifications to images used in the report are limited to cropping, magnification, file compression, or enhancement of color, brightness, or contrast for the sole purpose to improve clarity of the report. No other alterations are permitted.

PHOTOGRAPH NUMBER	DESCRIPTION
P1000786.JPG	engine propeller mounting surface.
P1000787.JPG	engine propeller mounting surface.
P1000788.JPG	left prop as received.
P1000789.JPG	left prop as received.
P1000790.JPG	left prop as received.
P1000791.JPG	left feather spring, pitch change rod.
P1000792.JPG	feather stop screws.
P1000793.JPG	feather stop screws.
P1000794.JPG	left hub assembly.
P1000795.JPG	left hub assembly.

P1000796.JPG	L2 hub/pilot tube.
P1000797.JPG	L3 hub/pilot tube.
P1000798.JPG	L1 hub/pilot tube.
P1000799.JPG	clamps and counterweights.
P1000800.JPG	clamps and counterweights.
P1000801.JPG	clamps and counterweights.
P1000802.JPG	spring and pitch change assembly.
P1000803.JPG	retainer clips.
P1000804.JPG	cylinder.
P1000805.JPG	cylinder.
P1000806.JPG	piston.
P1000807.JPG	piston.
P1000808.JPG	piston.
P1000809.JPG	left blades.
P1000810.JPG	left blades.
P1000811.JPG	left blades.
P1000812.JPG	L1 blade butt.
P1000813.JPG	L2 blade butt.
P1000814.JPG	L3 blade butt.
P1000815.JPG	L3 with template attached.
P1000816.JPG	template.
P1000817.JPG	right propeller as received.
P1000818.JPG	right propeller as received.
P1000819.JPG	right propeller as received.
P1000820.JPG	right propeller as received.
P1000821.JPG	hub assembly.
P1000822.JPG	R3 hub and pilot tube.
P1000823.JPG	R1 hub and pilot tube.
P1000824.JPG	R2 hub and pilot tube.
P1000825.JPG	serial number on right hub.
P1000826.JPG	link arms.
P1000827.JPG	link arms.
P1000828.JPG	link arms.
P1000829.JPG	link arms.
P1000830.JPG	link arms.
P1000831.JPG	clamps and counterweights.
P1000832.JPG	cylinder.
P1000833.JPG	pitch change rod, feathering spring assembly.
P1000834.JPG	feathering stop screws.
P1000835.JPG	piston.
P1000836.JPG	piston.
P1000837.JPG	feathering spring assembly, pitch change rod.
P1000838.JPG	R1 blade butt.
P1000839.JPG	R2 blade butt.
P1000840.JPG	R3 blade butt.
P1000841.JPG	right propeller blades.
P1000842.JPG	right propeller blades.
P1000843.JPG	right propeller blades.
P1000844.JPG	right propeller blades.
P1000845.JPG	right propeller blades.

P1000846.JPG	R2 blade tip.
P1000847.JPG	R1 blade tip.