



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

March 22, 2019

STRUCTURES

Group Chairman's Factual Report

ERA18FA120

**Attachment 2 – N104ER Maintenance Records
(10 pages)**

AIRFRAME MAINTENANCE LOG

DATE	TACH OR HOBBS	DESCRIPTION OF WORK PERFORMED. ALL DATA MUST BE ENDORSED WITH REPAIR STATION NUMBER OR
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EMBRY-RIDDLE
AERONAUTICAL UNIVERSITY

N710ER

Total Time: .3402.7
Tach Time: 2235.7

Placed aircraft on jacks. Inspected landing gear shock struts, determined rings left by wiper seals that strut compression was not abnormal. [REDACTED] Inspected struts for signs of overstress, deformation, loose or damaged trunion mounts. Insp wheel wells and LG attach points for buckling, cracks, overstress, wing skin buckling, actuator sidebrace for damage and condition. Insp wing attach bolt areas for slippage, damage, and overstress. Insp upper and lower wing skins for wrinkles, cracks, popped or missing rivets. Insp engine mount for distortion and damage. Inspected propeller for evidence of ground strike. Inspected fuselage and empennage for door alignment, buckling, loose or missing rivets. Performed retraction tests and emergency extension test. Checked rigging of gear indication switches. No defects noted.

The aircraft, airframe, aircraft engine or appliance identified above was inspected and repaired in accordance with current regulations of the Federal Aviation Administration and is accepted for return to service. Pertinent details of the repair/inspection are on file at the Repair Station under this work order: WO # RMS 2012 01922 Date: 22 MAR 2012

Signed: Nicola Elms-Ramirez [REDACTED] ERAU-22 Repair Station N3XR816N.

EMBRY-RIDDLE
AERONAUTICAL UNIVERSITY

N710ER

Total Time: 3416.7
Tach Time: 2249.7

Replaced propeller, B2D34C213-B, s/n off: 011204, s/n on: 020010. Prop installed Total Time: 3828.0, TSMOH: 0.0. Replaced oil door on top cowling. Work accomplished in accordance with PA28R Maintenance Manual Section 61-10-00. Performed ground run, no leaks or discrepancies noted.

The aircraft, airframe, aircraft engine or appliance identified above was inspected and repaired in accordance with current regulations of the Federal Aviation Administration and is accepted for return to service. Pertinent details of the repair/inspection are on file at the Repair Station under this work order: WO # RMS 2012 02022 Date: 23 MAR 2012


Signed: [REDACTED] Repair Station N3XR816N

MIKE FISHER
CRS N3XR816N

NEW AND SERVICEABLE PARTS TAGS

NEW AND SERVICEABLE PARTS TAGS

DATE	TACH OR HOBBS TIME :	DESCRIPTION OF WORK PERFORMED. ALL DATA MUST BE ENDORSED WITH REPAIR STATION NUMBER OR SIGNATURE AND CERTIFICATE NUMBER OF PERSON PERFORMING WORK
		<div data-bbox="511 577 617 682"> </div> <div data-bbox="625 577 990 672"> <p>EMBRY-RIDDLE AERONAUTICAL UNIVERSITY</p> </div> <div data-bbox="1226 546 1542 724" style="border: 1px solid black; padding: 5px;"> <p>A/C TOTAL TIME : <u>5786.9</u> ENG TOTAL TIME : <u>3675.7</u> ENG T.S.M.O.H. : <u>1495.9</u> TACH TIME : <u>4619.9</u> PROP T.S.M.O.H. : <u>NA</u> PROP TOTAL TIME : <u>1283.7</u></p> </div> <p>I certify that this <u>AIRCRAFT-PA28R (N104ER)</u> has been inspected in accordance with an <u>ANNUAL</u> inspection and was found to be in an airworthy condition. Time in Service : <u>5786.9</u></p> <p>Complied with: <u>ANNUAL</u> Inspection. Replaced vacuum relief filter. Serviced: hyd. fluid, battery & tires. Performed CO test. Cleaned & lubed yoke shafts & landing gear. Insp. ELT & battery (10-20) & FAR 91.207 Date (07-16). Complied with: S. B. 636 (Ignition switch). Performed retraction test and emergency gear extension. Repacked nose gear wheel bearings. Adjusted cable for copilots seat adjustment. Replaced left wing fuel sump drain. Installed new Teflon washer and tightened the nose gear upper drag link right bolt. Installed new nose gear actuator forward clevis bolt. Replaced right fuel cap. Installed new nose up stop. [REDACTED] [REDACTED] Performed retraction test and emergency gear extension.</p> <p>The aircraft, airframe, aircraft engine or appliance identified above was inspected and repaired in accordance with current regulations of the Federal Aviation Administration and is approved for return to service. Pertinent details of the repair/inspection are on file at the Repair Station under this work order: WO # <u>RMS 2015-06116</u> Date: <u>20 NOV 2015</u></p> <p>Signed: [REDACTED] <i>ATP</i> [REDACTED] <i>IA</i></p>
		<p>This aircraft has been updated with NavData Cycle: 1513 Which Expires: 01/07/16 AC TT: <u>5816.6</u> Tach Time: <u>4649.6</u> WO#: 2015 06448 Dated 12/09/15</p> <p>Signature: [REDACTED] 104 FAA Repair Station: N3XR816N</p>

1. Approving National Aviation Authority/Country: FAA/UNITED STATES		2. AUTHORIZED RELEASE CERTIFICATE FAA Form 8130-3, AIRWORTHINESS APPROVAL TAG				3. Form Tracking Number: 154151	
4. Organization Name and Address: Aerospace Welding Minneapolis, Inc. 1045 Gemini Road Eagan MN 55121						5. Work Order/Contract/Invoice Number 154151	
6. Item:	7. Description:	8. Part Number:	9. Eligibility:*	10. Quantity:	11. Serial/Batch Number:	12. Status/Work:	
1	MOUNT	67119-57	N/A	1 each	154151	REPAIRED	
13. Remarks: REF: WORK ORDER #154151. Aerospace Welding Minneapolis, Inc. certifies that the work specified in block 12/13 was carried out in accordance with EASA part 145 and in respect to that work, the component is considered ready for release to service under EASA part 145 Approval Number: EASA. 1456155. This form covers certification of the part identified in block 7/8 only and any additional EASA requirements are the responsibility of the installer.							
14. Certifies the items identified above were manufactured in conformity to:				19. <input checked="" type="checkbox"/> 14 CFR 43.9 Return to Service <input type="checkbox"/> Other regulation specified in Block 13			
<input type="checkbox"/> Approved design data and are in a condition for safe operation. <input type="checkbox"/> Non-approved design data specified in Block 13.				Certifies that unless otherwise specified in Block 13, the work identified in Block 12 and described in Block 13 was accomplished in accordance with Title 14, Code of Federal Regulations, part 43 and in respect to that work, the items are approved for return to service.			
15. Authorized Signature:		16. Approval/Authorization No.:		20. Authorized Signature		21. Approval/Certificate No.:	
						UWDR792L	
17. Name (Typed or Printed):		18. Date:		22. Name (Typed or Printed):		23. Date (m/d/y):	
				Kevan Pugh		Aug 30 2013	
User/Installer Responsibilities							
<p>It is important to understand that the existence of this document alone does not automatically constitute authority to install the part/component/assembly.</p> <p>Where the user/installer performs work in accordance with the national regulations of an airworthiness authority different than the airworthiness authority of the country specified in Block 1, it is essential that the user/installer ensures that his/her airworthiness authority accepts parts/components/assemblies from the airworthiness authority of the country specified in Block 1.</p> <p>Statements in Blocks 14 and 19 do not constitute installation certification. In all cases, aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.</p>							

AEROSPACE WELDING MINNEAPOLIS, INC.

1045 Gemini Road, Eagan, MN 55121 651-379-9888

154151

FAA Repair Station #UWDR792L

Form 100

Discrepancies Noted:

- | | | |
|---|--|--|
| <input type="checkbox"/> OUTERSHELL | <input type="checkbox"/> BALL JOINT | <input type="checkbox"/> BELLOWS |
| <input type="checkbox"/> OVERBOARD | <input type="checkbox"/> BELL JOINT | <input type="checkbox"/> HEAT FINS |
| <input type="checkbox"/> BAFFLE | <input type="checkbox"/> INLAY | <input type="checkbox"/> STRAIGHT TUBE |
| <input type="checkbox"/> END PLATE | <input type="checkbox"/> OVERLAY | <input type="checkbox"/> BRACKET |
| <input type="checkbox"/> SHROUD RING | <input type="checkbox"/> INLET EXTENSION | <input type="checkbox"/> BOLT FLANGE |
| <input type="checkbox"/> BEADED END | <input type="checkbox"/> RISER TUBE | <input type="checkbox"/> TOP TUBE |
| <input type="checkbox"/> TAB | <input type="checkbox"/> FLANGE | <input type="checkbox"/> CRACK WELD |
| <input type="checkbox"/> SHAFT | <input type="checkbox"/> TAILPIPE | <input type="checkbox"/> SLIP JOINT |
| <input type="checkbox"/> BUTTERFLY | <input type="checkbox"/> FLOW DIVIDER | <input type="checkbox"/> ELBOW |
| <input type="checkbox"/> CLEAN & INSP. | <input type="checkbox"/> BODY | <input type="checkbox"/> SKIN |
| <input checked="" type="checkbox"/> TUBES | <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |

INSPECTOR'S INITIALS AP

Corrective Action: ITEMS REPLACED OR REPAIRED

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> TUBES | <input type="checkbox"/> BALL JOINT | <input type="checkbox"/> BELLOWS |
| <input type="checkbox"/> OVERBOARD | <input type="checkbox"/> BELL JOINT | <input type="checkbox"/> HEAT FINS |
| <input type="checkbox"/> BAFFLE | <input type="checkbox"/> INLAY | <input type="checkbox"/> STRAIGHT TUBE |
| <input type="checkbox"/> END PLATE | <input type="checkbox"/> OVERLAY | <input type="checkbox"/> BRACKET |
| <input type="checkbox"/> SHROUD RING | <input type="checkbox"/> INLET EXTENSION | <input type="checkbox"/> BOLT FLANGE |
| <input type="checkbox"/> BEADED END | <input type="checkbox"/> RISER TUBE | <input type="checkbox"/> TOP TUBE |
| <input type="checkbox"/> TAB | <input type="checkbox"/> FLANGE | <input type="checkbox"/> CRACK WELD |
| <input type="checkbox"/> SHAFT | <input type="checkbox"/> TAILPIPE | <input type="checkbox"/> SLIP JOINT |
| <input type="checkbox"/> BUTTERFLY | <input type="checkbox"/> FLOW DIVIDER | <input type="checkbox"/> ELBOW |
| <input type="checkbox"/> CLEAN & INSP. | <input type="checkbox"/> BODY | <input type="checkbox"/> SKIN |
| <input checked="" type="checkbox"/> TUBES | <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |

INSPECTOR'S INITIALS AP

Material Type

- 347 SS FILLER ROD
- 321 SS
- 4130 CHROMALLY
- 4130 ROD
- INCONEL
- INCONEL ROD
- ER 70S-2
- _____

Approved Data

- 43.13-1B
- MANUFACTURER'S MANUAL
- AIR CARRIER'S MANUAL
- _____

NAME EMBRY-RIDDLE AERONAUTICAL		S/N AWI 154151	Job: 69773
ADDRESS ATTN: ACCOUNTS PAYABLE		CITY DAYTONA BEACH FL 32114-	Preliminary Date 7/31/2013 <u>AP</u>
Make & Model PIPER PA 28	Part Number 67119-57	3900	Hidden Damage Date 8/15/2013 <u>AP</u>
Unit Description PA28R-201T	Registration No.		In Progress Date 8/26/2013 <u>AP</u>
			Final Date 8/30/2013 <u>AP</u>

CUSTOMER SERVICES REQUESTED

Replaced tube going from lower left tube cluster to forward left landing gear attach point. Replaced tube going from lower right tube cluster to forward right landing gear attach point. Replaced tube going from forward left landing gear attach point to aft left landing gear attach point. Replaced tube going from forward right landing gear attach point to aft right landing gear attach point, reinstalled down lock block and mounting lug near forward right landing gear attach point. Stop drilled and weld repaired cracks in tubes on lower outboard side of engine attach points. Topcoat black.

- | | | | |
|--|--|---|--------------------------------|
| <input checked="" type="checkbox"/> REPAIRS | <input checked="" type="checkbox"/> CHROMATE PRIME | <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |
| <input checked="" type="checkbox"/> A.D. NOTES | <input checked="" type="checkbox"/> DIE PENETRANT | <input type="checkbox"/> CORROSION PROTECT NEW TUBE | <input type="checkbox"/> _____ |
| <input type="checkbox"/> PRESSURE TEST | <input checked="" type="checkbox"/> DEMAGNETIZE | <input type="checkbox"/> PRIMER COAT | <input type="checkbox"/> _____ |

MAINTENANCE RELEASE

The aircraft/component identified hereon was repaired and inspected in accordance with current Federal Aviation Regulations and was found airworthy for Return to Service. Pertinent details of the repair are on file at this agency.

AUTHORIZED AND CONDITIONS AGREED TO AS STATED ABOVE

BY _____ DATE 8/30/2013

AIRFRAME MAINTENANCE LOG

DATE	TACH HOBE TIME		NUMBER OR MINING WORK
		EMBRY-RIDDLE AERONAUTICAL UNIVERSITY	
		<p>I certify that this AIRCRAFT-PA28R (N104ER) has been inspected in accordance with an ANNUAL inspection and was found to be in an airworthy condition.</p> <p style="text-align: right;">Korey Dickerson ERAU 45 N3XR816N 1619</p>	
		<p>Time in Service : 7603.0</p> <p>Complied with: ANNUAL Inspection.</p> <p>Replaced vacuum relief filter. Serviced: hyd. fluid, battery & tires. Performed CO test. Cleaned & lubed yoke shafts & landing gear. Insp. ELT & battery (10-2020) & FAR 91.207 Date (06-2018). C/W left and right wing rib crack inspection. Complied with: S. B. 636 (Ignition switch). Performed retraction test and emergency gear extension. C/W hydraulic contamination check. Repacked NLG wheel bearings. Lubed stab trim actuator. C/W SB1156 (NG drag link bolt/bushings). Replaced central vac filter. Cleaned and lubed RMG outboard down lock bolt. Replaced RMG outboard down lock bolt cotter pin. Replaced all torque link bolt cotter pins on LMG and RMG. Replaced cotter pin at pilot right rudder pedal to brake attachment point. Replaced RMG center torque link bolt cotter pin. Replaced wing step material. Cleaned and lubed LMG inboard bolt on down lock. Replaced forward bolt and nut on NLG actuator.</p>	
		<p>The aircraft, airframe, aircraft engine or appliance identified above was inspected and repaired in accordance with current regulations of the Federal Aviation Administration and is approved for return to service. Pertinent details of the repair/inspection are on file at the Repair Station under this work order: WO # RMS 2018 01230 Date: 7 MAR 2018</p>	
		<p>Signed: [REDACTED] Repair Station N3XR816N.</p> <p style="text-align: center;">Korey Dickerson</p>	

A/C TOTAL TIME :	7603.0
ENG TOTAL TIME :	3418.6
ENG T.S.M.O.H. :	1223.1
TACH TIME :	1723.1
PROP T.S.M.O.H. :	N/A
PROP TOTAL TIME :	377.1

EMBRY-RIDDLE
AERONAUTICAL UNIVERSITY

N104ER

ACTT: 7637.3
TACH: 1757.4

Removed RMG actuator and replaced with new. Performed multiple ops check, ops check good. No other defects noted at this time. A/C OK for return to service.

The aircraft, airframe, aircraft engine or appliance identified above was inspected and repaired in accordance with current regulations of the Federal Aviation Administration and is approved for return to service. Pertinent details of the repair / inspection are on file: WO # RMS 2018-01574 Date: 03/26/2018

Signed: [REDACTED] Certified Repair Station N3XR816N

Carlos Elias

EMBRY-RIDDLE
AERONAUTICAL UNIVERSITY

AIRFRAME

N104ER

Time in Service: 7649.0

Korey Dickerson ERAU 45
N3XR816N 1619

A/C TOTAL TIME: 7649.0
ENG TOTAL TIME: 3464.6
ENG T.S.M.O.H.: 1269.1
TACH TIME: 1769.1
PROP T.S.M.O.H.: N/A
PROP TOTAL TIME: 423.1

Complied with **EMBRY-RIDDLE'S 50 HOUR INSPECTION CHECKLIST**.

Inspected and serviced hydraulic fluid, battery, and tire pressure as needed. Inspected interior & exterior lighting, cabin, fuselage, empennage, wings, landing gear, brake linings, brake calipers, and engine compartment for general condition and signs of excess wear. No discrepancies were found. Replaced left and right main gear brake pads and cleaned right brake caliper of debris. Replaced cabin door handle and set screw. Tested ELT and noted no issues. Dressed propeller. No other defects noted, aircraft ok for return to service.

The aircraft, airframe, aircraft engine or appliance identified above was inspected and repaired in accordance with current regulations of the Federal Aviation Administration and is approved for return to service. Pertinent details of the repair / inspection are on file at the Repair Station under this work order: WO # **RMS 2018 01692** Date: **29 MAR 2018**

Signed: [REDACTED] Certified Repair Station N3XR816N.

Korey Dickerson

NEV

LE

This aircraft has been updated with NavData
 Cycle: 1804 Which Expires: 04/26/18
 AC TT: 7645.5 Tach Time: 1765.6
 WO#: 2018 01643 Dated 03/29/18

Signature: [REDACTED]
 FAA Repair Station: N3XR816N



POWER/AVIATION, INC.
FAA REPAIR STATION # ZLZR567L

EDDY CURRENT INSPECTION REPORT
FAA REPAIR STATION # ZLZR567L (Form PAI-ET-1)

Client: Embry Riddle Aeronautical University	Date: 04/09/2018	Page: 1 of 1
PAI Work Order #: 418393	Client Purchase Order #: Pending	
Component: Lower Forward Spar Bolt Holes (C-1 & D-1)	Aircraft Serial No.: 2844135	
Material: Aluminum	Aircraft Model & Reg: PA-28R-201 /N104ER	
Procedure Specifications: Mil-Std-271 / 57-40-00	Acceptance Standard: No Cracks	

TECHNIQUE DATA

Method: HFEC – Eddy Current	Probe Type: VM101BS-3/8"
Equipment Manufacturer: Nortec	Coil Configuration: Absolute
Equipment Model #: 500C	Test Frequency: 200 KHz
Equipment Serial #: #: N500X1693P070567	Calibration Block #: P/N 23-55 S/N: 010 Combination Bolt Hole / Surface Crack Block

Item	Quantity	Remarks	Accept	Reject
1	1	<p>L/H & R/H Lower Forward Spar Bolt Holes (C-1 & D-1): Performed high frequency eddy current (HFEC) bolt hole inspection on the left and right lower forward spar bolt holes (C-1 & D-1) per Piper Maintenance Manual drawing (figure 1) section 57-40-00 dated Jul 30/07 and per MIL-STD 271 for possible cracks. No relevant indications noted at the time of inspection.</p> <p align="center">Aircraft Tach: 1780.8</p>	X	

POWER/AVIATION INSPECTOR

LEVEL

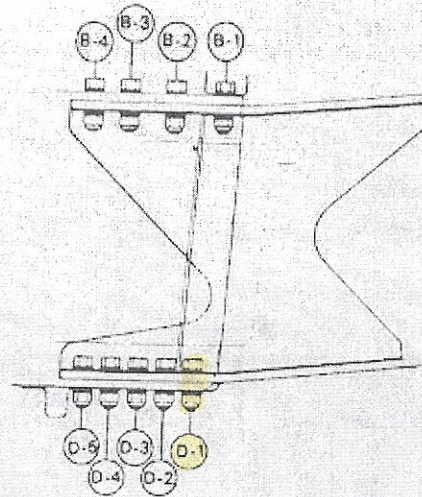
DATE

We hereby certify that the parts were tested in conformance with the specification noted. This report is expressly limited to Power / Aviation Inc.'s interpretation of the results obtained from the test specified and does not constitute a representation, warranty or guaranty of the actual condition of the materials tested. Power /Aviation Inc. expressly disclaims any responsibility for any loss, cost, damage or expense, including personal injury or death, caused by or attributable to Power/Aviation, Inc.'s representation of conditions or the performance of any test

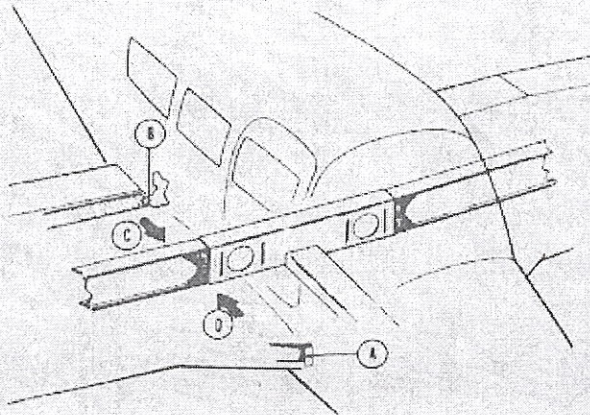
MAINTENANCE MANUAL

BOLT LEGEND			WASHER	
POS	BOLT *	NUT *	UNDER HEAD	UNDER NUT
A-1	AN176-13A	MS21042-6	(1) AN960-616	(1) 96352-3
A-2	AN176-12A	MS21042-6	(1) AN960-616	(1) 96352-3
A-3	AN176-12A	MS21042-6	(1) AN960-616	(1) 96352-3
A-4	AN176-12A	MS21042-6	(1) AN960-616	(1) 96352-3
B-1	AN176-14A	MS21042-6	(1) AN960-616	(1) AN960-616
B-2	AN176-13A	MS21042-6	(1) AN960-616	(1) AN960-616
B-3	AN176-13A	MS21042-6	(1) AN960-616	(1) AN960-616
B-4	AN176-13A	MS21042-6	(1) AN960-616	(1) AN960-616
C-1	AN176-13A	MS21042-6	(1) 96352-3	(1) AN960-616
C-2	AN176-13A	MS21042-6	(1) 96352-3	(1) AN960-616
C-3	AN176-13A	MS21042-6	(1) 96352-3	(2) AN960-616
C-4	AN176-13A	MS21042-6	(1) 96352-3	(2) AN960-616
C-5	AN176-13A	MS21042-6	(1) 96352-3	(2) AN960-616
D-1	AN176-13A	MS21042-6	(1) 96352-3	(1) 96352-3
D-2	AN176-13A	MS21042-6	(1) 96352-3	(1) AN960-616
D-3	AN176-13A	MS21042-6	(1) 96352-3	(2) AN960-616
D-4	AN176-13A	MS21042-6	(1) 96352-3	(2) AN960-616
D-5	AN176-13A	MS21042-6	(1) 96352-3	(1) 96352-3

* TORQUE
UPPER SPAR CAP BOLTHEADS AND LOWER SPAR CAP NUTS
360-390 IN.-LBS.

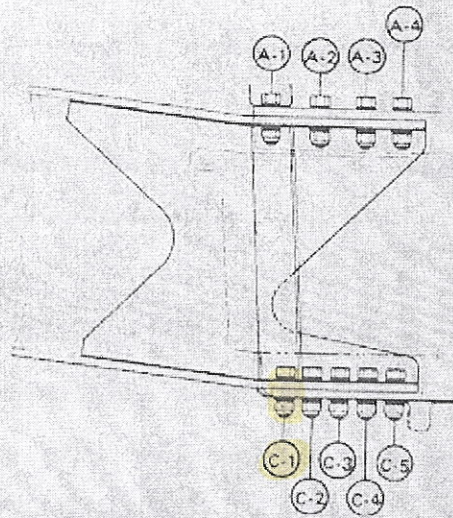


SKETCH C



WARNING:

DO NOT DRIVE BOLTS IN OR OUT OF THE MAIN SPAR ATTACHING BOLT HOLES (C AND D). TAKE EXTRA CARE IN REMOVING AND REPLACING THESE BOLTS TO PRECLUDE DAMAGING THE BOLT HOLES.



SKETCH D

Wing Installation
Figure 1 (Sheet 1 of 2)



CERTIFICATE OF CALIBRATION

CERTIFICATE #17306N500X1693P070567

DATE: 11/2/2017

Power Aviation Inc.
Customer
103017-JK-1
PO#
Olympus
Manufacturer

N/A
Rel#
Nortec 500C
Model Number

N/A
Ref#
N500X1693P070567
Serial Number

This is to certify that the above named instrument was calibrated on the date shown in accordance with the original manufacturer's specifications, and/or procedure #ENDT-CP201 utilizing test standards traceable to the National Institute of Standards and Technology. Completed under QA manual ENDT-QA100 dated 1-13-15 REV 1. Our calibration system complies with ASTM 317, 709, 1444, MIL-STD 45662A*, ISO 10012-1, ANSI/NCSL-Z540-1-1994, 10 CFR 21 and 10 CFR 50 Appendix B. All certification data sheets were completed and are on file at Eastern NDT, Inc.

Temperature: 71°

Humidity: 41%

Received: In Tolerance X Out of Tolerance

Comments: None.

11/2/17
Date Certified



Certified By
Electronics Technician
John T. Bowman

11/2/18
Recertification Date

*Canceled Document



CERTIFICATE OF CALIBRATION

CERTIFICATE #17306N500X1693P070567

PAGE 2 OF 2

Customer: Power Aviation Inc.

Model Number: Nortec 500C

Serial Number: N500X1693P070567

Analog

Digital/Phase Display

<u>Frequency</u>	<u>Received Readings</u>	<u>Returned Readings</u>
50 Hz	50 Hz	50 Hz
100 Hz	100 Hz	100 Hz
500 Hz	500 Hz	500 Hz
1 KHz	1 KHz	1 KHz
250 KHz	250 KHz	250 KHz
500 KHz	500 KHz	500 KHz
750 KHz	750 KHz	750 KHz
1 MHz	1 MHz	1 MHz
6 MHz	6 MHz	6 MHz
12 MHz	12 MHz	12 MHz

Analog eddy current instruments are designed to set their frequency automatically depending upon probe selection. The frequency listed in the table has been verified to be within the manufacturers operating specifications.

Permissible limits are +/-10%

EQUIPMENT USED IN CALIBRATIONS

<u>Instrument</u>	<u>Mfg.</u>	<u>Model #</u>	<u>Serial #</u>	<u>Cal Date</u>	<u>NIST Traceability</u>
<input checked="" type="checkbox"/> Oscilloscope	Tektronix	TBS1052B	C015226	3-13-17*	7693135

* Calibrated on a yearly basis