Restoration
of
CULVER CADET
NC 32482
Mgf. 1941

by
Ed Byars
and
Jerry Reider

Seneca, SC
2002-2005

CULVER A/C LOG BOOK ENTRY 10/20/05

Culver Restoration (NC32482): _____

NC 32482 Serial: #215 TT: 1736:85 Tach: 01.2hrs. rev. 10

All fabric covering on wings, fuselage, and tail surfaces removed.

A): Wing spars and all supporting structure meticulously inspected. All diagonal steel drag structure stripped and primed. Minor wood repairs made to wood on non-structural fairings in wing root area. Ailerons stripped, inspected, primed and prepared for recover. All fittings and hardware stripped, inspected, and primed. All plywood areas sanded, inspected, and varnished.

B): Fuselage wood surfaces sanded, inspected internally and on all outer surfaces and varnished.

C): Tail surfaces similarly prepared. Elevator trim system removed disassembled cleaned and lubricated. New trim cable installed IAW AC 43.13-1-B Chapter 7 Section 8.

D): Entire aircraft recovered with Poly-Fiber Process (2.6 oz medium weight fabric and finished in Aerothane (#120 Daytona White and #191 Pontiac Red) in accordance with STC No. SA-1008-WE, reissued 6Oct 1992 and approved for the Culver. All work, finishing, taping, was in strict accordance with Poly Fiber instructions. Paint scheme is original Culver. See FAA Form 337 for details.

E): Interior panels were removed and replaced with 1/16" varnished White Birch plywood (Aircraft grade).

F): Instrument panel (wood) was removed and replaced with new 0.060" 2024T3 aluminum panel covered with 1/64" white birch veneer.

G):All instruments removed and overhauled or replaced with new (with proper internal markings). New Microair Radio and Transponder/encoder installed. See Form 337 for this installation.

H):All landing gear mechanism removed, stripped, cleaned, repainted, lubricated, reinstalled, adjusted, safetied, inspected, and cycled for correct operation. All associated AN hardware replaced with new.

I): Replaced all electrical wiring in cabin, engine compartment, wings, and fuselage with new wire and connectors. Installed all new switches and circuit breakers IAW AC 43.13-1B Chapter 11 Sections 1,3,4,5,and 8.

J):Wheels, brakes, struts, and C springs removed, disassembled, cleaned, inspected, repainted, parts replaced as necessary, reassembled, and adjusted. New tires and tubes installed. All brake lines replaced with new. Master brake cylinders overhauled. Cleveland kit 100-102 installed. See FAA Form 337 for same.

K): Replaced all control cables and associated hardware in rudder system including steerable tailwheel system.

L): Installed new Strobe light on fuselage bottom. See Form 337 for same.

M): Fabricated and installed top rear and bottom wing root fairings.

N): Install new windshield and glare shield.

O): Repaired and recontoured as necessary both doors and installed new windows therein.

P): Fabricated and installed new top and bottom engine cowls with new hardware IAW AC43.13-1B Chap.3 Sec 4.

Q): Installed new Concorde RG-25 Battery IAW AC43,13-1B Chap 11 Section 2

R): Installed new approved replacement seatbelts and shoulder harnesses IAW AC43.13-1B Chap 9 Section 4

S): Installed new leather seat bottoms with Temper Foam and new leather seat back with approved materials IAW FAR 25.853 (a) Appendix F Part I (a) (1) (ii).

T): Weighed A/C.EW=921# Calculated cg =18.6", within limits. Copy of W&B dated 5-14-05 placed in A/C.

U): Completed an annual inspection per FAR 43 Appendix D checklist. Checked ELT IAW 91.207, replaced batteries, due 1/12. Checked Ads through 2005-19, CW 76-07-12 Bendix switches by functional check, next due 101.2. Post maintenance operational checklist complete.

I certify this aircraft has been inspected IAW an annual inspection and was found to be in airworthy condition.

_____Date:_____

John R. Van Surdam IA238040196AP

CULVER ENGINE LOG BOOK ENTRY 10/20/05

CONTINENTIAL C-85-12 Serial # 20186-6-12 Date:_____

Tach: 01.2hrs TT:928.7hrs SMOH:382.7hrs

A): Installed all new Exhaust system with new Blo-Proof gaskets and new Carb Heat and Cabin Heat muffs.

B): Replaced with new all fuel and oil hoses.

C): Replaced with new all control housings and cables including Throttle, Mixture, Carb. Heat, and Cabin Heat. Installed new Cabin Heat air box and diffuser.

D): Replaced with new all SCAT ducts.

E): Replaced with new all instrument hoses.

F): Install all new spark plugs.

G): Installed New left magneto (Slick Model 4301)

H): Installed new engine mount. (by Kosola)

I): Installed new engine mount bushings

J): Performed 100 hr inspection: Compression test: #1 80/70 #2 80/76 #3 80/75 #4 80/74 . Checked timing. Changed oil. 4 qts. Aero Shell 100Plus. Cleaned screens.

K): Installed new B&C Specialty Products Model BC320 Starter IAW B&C Approved Model List (STC#) SE00145 WI issued Mar.28, 1994. See Form 337. Installed new B&C alternator. See FAA Form 337

L): Installed overhauled McCauley propeller Model 1A90 IAW AC43.13-1-B Chapter 8 Sections 5 and 6.

I certify that this engine has been inspected IAW a 100 hour inspection and AC43.13 1-B Chapter 8 Sections 1 and 3 and was found to be airworthy.

Date:

Edward F. Byars A&P # 248-28-9428

AVIONICS

US Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020

For FAA Use Only
Office Identification

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in civil penalty not to exceed $1,000 for each such violation (Section 901 Federal Aviation Act of 1958).

1. Aircraft	Make: Culver	Model: LCA
	Serial No.: 215	Nationality and Registration Mark: N32482
2. Owner	Name *(As shown on registration certificate)*: ECHO DELTA LTD	Address *(As shown on registration certificate)*: 3511 SILVERSIDE RD STE 105 WILMINGTON DE 19819-4902

3. For FAA Use Only

The data/~~alteration~~ identified hereon complies with the applicable airworthiness requirements and is approved only for the above described aircraft, subject to conformity inspection by a person authorized in FAR 43, section 43.7.

OCT 14 2005
Date

Signature of FAA Inspector

4. Unit Identification / **5. Type**

Unit	Make	Model	Serial No.	Repair	Al
AIRFRAME	*(As described in Item 1 above)*				
POWERPLANT					
PROPELLER					
APPLIANCE	Type / Manufacturer				

6. Conformity Statement

A. Agency's Name and Address	B. Kind of Agency		C. Certificate No.
EDWARD F BYARS 401 RUDDER RIDGE SENECA SC 29678	X	U.S. Certificated Mechanic	248 29 9428
		Foreign Certificated Mechanic	
		Certificated Repair Station	
		Manufacturer	

D I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Date	Signature of Authorized Individual
OCTOBER 11,2005	Edward F Byars

7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY							
		FAA Flt. Standards Inspector		Manufacturer	X	Inspection Authorization	Other *(Specify)*
		FAA Designee		Repair Station		Person Approved by Transport Canada Airworthiness Group	

Date of Approval or Rejection	Certificate or Designation No.	Signature of Authorized Individual
	238 04 0196	John R. Van Surdam

BACK OF AVIONICS FORM 337

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

A/C Make: Culver Model: LCA S/N 215 Reg. # N32482
Revision:_____Date:_____System:_____

1. Installed Microair Transceiver, Transponder, Transponder antenna, and Ameri-King Encoder and removed Terr Transceiver from N 32482, a Culver LCA, sn 215.

2. Removed Terra 720 Transceiver from instrument sub panel at Station +4.
Installed Microair Avionics 760 channel VHF Transceiver in lower sub panel at Station +4 IAW manufacturer's installation instructions revision K01/2000.
Installed Microair Avionics T2000SLF Transponder in lower sub panel at Station +4 IAW T2000 Installation Manual V23.doc23rd August 2003.
Installed Ameri-King Altitude Encoder Model AK-350 behind sub panel at station +4 IAW Section II of Manufacturer's Installation Manual IM-3501001 rev.2.3 21/11/03.
Installed Microair Transponder Antenna in lower fuselage aluminum panel at station -7.
Installed new 10 amp Switch/Circuit Breaker labeled *Avionics Master* in instrument panel. between the units an the 12 V bus. All work was performed IAW AC43.13-1B Chapter 11, Sections 1,3 & 4. Wire gage determined from Section 5.
Installations were made prior to and are reflected in the weight and balance of aircraft dated May 14, 2005 a copy of which was placed in the aircraft and an entry of same made in the aircraft log.

3. Controls all both installed units are operated by knobs and buttons from the front faces of the units and are in easy reach.

4. Servicing information is n/a

5. Normal operation should be assured at each annual inspection. Transponder required to be certified biannuall

6. Trouble shooting information is n/a.

7. For removal and/or replacement refer to manufacturer's installation manual revision K01/2000 section 6 and T2000V28.

8. Diagrams of the installation are not required

9. There are no special inspection requirements.

10. Protective treatments is n/a

11. The structural fasteners are n/a

12. Special tools are not required.

13. Commuter Aircraft is n/a

14. There are no recommended overhaul periods.

15. There are no additional airworthiness limitations.

16. For revision of this ICA, a letter will be submitted to the local FSDO with a copy of the revised form 337 and revised ICA. The FAA inspector accepts the change by signing block 3 and including the following statement: *Ma alterations have been accepted by the FAA superceding the instructions for Continued Airworthiness.* Once the revision has been accepted, a maintenance entry will be made identifying the revision, its location, and a date on the form 337.

----------END----------

☐ Additional Sheets Are Attached

BRAKES

US Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020

For FAA Use Only
Office Identification

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in civil penalty not to exceed $1,000 for each such violation (Section 901 Federal Aviation Act of 1958).

1. Aircraft	Make: CULVER	Model: LCA
	Serial No.: 215	Nationality and Registration Mark: N32482
2. Owner	Name *(As shown on registration certificate)*: ECHO DELTA LTD	Address *(As shown on registration certificate)*: 3511 SILVERSIDE RD STE 105 WILMINGTON DE 19819-4902

3. For FAA Use Only

~~The data/attachments~~ identified herein complies with the applicable airworthiness requirements and is approved only for the above described aircraft, subject to conformity inspection by a person authorized in FAR, section 43.7.

OCT 19 2005
Date

Signature of FAA Inspector SO-FSDO-13

4. Unit Identification				**5. Type**	
Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	(As described in Item 1 above)				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type / Manufacturer				

6. Conformity Statement

A. Agency's Name and Address	B. Kind of Agency	C. Certificate No.
EDWARD F BYARS 401 RUDDER RIDGE SENECA SC 29678	X U.S. Certificated Mechanic Foreign Certificated Mechanic Certificated Repair Station Manufacturer	248 28 9428

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Date	Signature of Authorized Individual
October 19 2005	Edward F Byars Edward F Byars

7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY							
		FAA Flt. Standards Inspector		Manufacturer	X	Inspection Authorization	Other *(Specify)*
		FAA Designee		Repair Station		Person Approved by Transport Canada Airworthiness Group	

Date of Approval or Rejection	Certificate or Designation No.	Signature of Authorized Individual
October 19 2005	238040196	John R Van Surdam John R Van Surdam

BACK OF BRAKES 337 FORM

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)
A/C Make: Culver Model: LCA S/N 215 Reg. # N32482

Revision:_____ Date:_____ System:_____

1. Removed OEM Expander tube hydraulic brake sysem and Installed STC Cleveland Conversion Kit 199-102 on N32482, a Culver LCA, sn 215

2.Removed original expander tube hydraulic brakes, 5.00-4 tires and 4.00 wheels.
Retained original master brake cylinders and toe pedals.
Installed Cleveland Kit 100-102 IAW Cleveland Product Reference Memo 13A released Nov 4 1987 rev A July 1 1995 and Drawing 50-76 dated 5-28-51 with 5.00-5 tires and tubes.
New Cleveland torque plates bolted directly on Culver axle flanges.
Calipers mounted forward for clearance.
Landing gear, after new tires installed and inflated, were retracted to insure wheel well clearance.
Braking and taxi tests performed to insure proper operation.
Conditioning procedure for linings was performed in accordance with PRM 13A page 1.
Engineering analysis was made to justify choice of Cleveland kit used. The brake system meets the minimum brake deceleration requirement of 10 ft/sec/sec as shown on Cleveland dwg. 33269.

3.Toe pedal controls were verified adequate for full power run up and for normal differential braking control.

4. Servicing of fluid reservoir was done at installation and should be repeated at each annual inspection and at other times if braking power is degraded.

5: Maintenance Instructions: As needed and at each annual inspection.

6: Trouble Shooting Information: Inspect reservoir fluid level, caliper leakage, wheel bearing lubication, and lining thickness as necessary for proper operation.

7. Removal and replacement must be done in accordance with Cleveland Product Reference Memo 73 and 13A and AC 43.13 1B, Chapter 9 Section 1 and 2.

8: Diagrams of the installation are not required.

9. There are no special inspection requirements

10. Protective treatments is N/A.

11. Structural fasteners are N/A

12. Special tools are not required.

13. Commuter aircraft is N/A

14. There are no recomended overhaul periods.

15. There are no additional airworthiness limitations

16. For revision of this ICA, a letter will be submitted to the local FSDO with a copy of the revised form 337 and revised ICA. The FAA inspector accepts the change by signing block 3 and including the following statement: *Major alterations have been accepted by the FAA superceding the instructions for Continued Airworthiness.* Once the revision has been accepted, a maintenance entry will be made identifying the revision, its location, and a date on the form 337.

----------END----------

☐ Additional Sheets Are Attached

FABRIC

US Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020

For FAA Use Only
Office Identification

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in civil penalty not to exceed $1,000 for each such violation (Section 901 Federal Aviation Act of 1958).

1. Aircraft	Make: CULVER	Model: LCA
	Serial No.: 215	Nationality and Registration Mark: N32492
2. Owner	Name *(As shown on registration certificate)*: ECHO DELTA LTD	Address *(As shown on registration certificate)*: 3511 SILVERSIDE RD STE 105 WILMINGTON DE 19810-4811

3. For FAA Use Only

4. Unit Identification				**5. Type**	
Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	*(As described in Item 1 above)*				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type / Manufacturer				

6. Conformity Statement

A. Agency's Name and Address	B. Kind of Agency		C. Certificate No.
EDWARD F BYARS 431 RUDDER RIDGE SENECA SC 29678	X	U.S. Certificated Mechanic	3482894?8
		Foreign Certificated Mechanic	
		Certificated Repair Station	
		Manufacturer	

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Date	Signature of Authorized Individual
OCTOBER 19 2005	EDWARD F BYARS

7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY							Other *(Specify)*
		FAA Flt. Standards Inspector		Manufacturer	X	Inspection Authorization	
		FAA Designee		Repair Station		Person Approved by Transport Canada Airworthiness Group	

Date of Approval or Rejection	Certificate or Designation No.	Signature of Authorized Individual
OCTOBER 19 2005	3396431??	JOHN R VAN SURDAM

BACK OF FABRIC 337 FORM

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

Installed Poly-Fiber covering materials IAW STC SA1008WE on N32482, a Culver LCA, sn 215. The fabric used was 2.7 oz. All work was performed IAW the Poly-Fiber Application Manual. A new weight and balance was performed and is dated May 15, 2005.

----------END----------

Additional Sheets Are Attached

ALTERNATOR

US Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020

For FAA Use Only

Office Identification

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in civil penalty not to exceed $1,000 for each such violation (Section 901 Federal Aviation Act of 1958).

1. Aircraft	Make: CULVER	Model: LCA
	Serial No.: 215	Nationality and Registration Mark: N32482
2. Owner	Name *(As shown on registration certificate)*: ECHO DELTA LTD	Address *(As shown on registration certificate)*: 3511 SILVERSIDE RD STE 105 WILMINGTON DE 19819-4902

3. For FAA Use Only

The data ~~alteration~~ identified herein complies with the applicable airworthiness requirements and is approved only for the above described aircraft, subject to conformity inspection by a person ~~authorized~~ in FAR, section 43.7.

OCT 19 2005
Date

Signature of ~~FAA Inspector~~ SF-BBO-13

4. Unit Identification / **5. Type**

Unit	Make	Model	Serial No.	5. Type: Repair	5. Type: Alteration
AIRFRAME	(As described in Item 1 above)				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type:				
	Manufacturer:				

6. Conformity Statement

A. Agency's Name and Address	B. Kind of Agency		C. Certificate No.
EDWARD F BYARS 401 RUDDER RIDGE SENECA SC 29678	X	U.S. Certificated Mechanic	248 28 9428
		Foreign Certificated Mechanic	
		Certificated Repair Station	
		Manufacturer	

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Date	Signature of Authorized Individual
OCTOBER 19 2005	EDWARD F BYARS

7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is [x] APPROVED [ ] REJECTED

BY							
		FAA Flt. Standards Inspector		Manufacturer	X	Inspection Authorization	Other *(Specify)*
		FAA Designee		Repair Station		Person Approved by Transport Canada Airworthiness Group	

Date of Approval or Rejection	Certificate or Designation No.	Signature of Authorized Individual
OCTOBER 19 2005	238040196	JOHN R VAN SURDAM

BACK OF ALTERNATOR 337 FORM

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

A/C Make: Culver Model: LCA S/C: 215 Reg. # N32482

Revision:_____ Date:_____ System:_____

1.Installed B&C Model 200G Alternator, B&C Model PMR1-14 Regulator, OVM-14 over voltage module and 10KuF capicitor on C-85-12 engine in place of OEM Generator and Regulator in N32482, a Culver LCA, sn 215.

2. Removed OEM Delco Generator and Regulator and installed B&C Model 200G Alternator, Model PMR1-14 Regulator, OVM-14 over voltage module and 10KuF capicitor IAW with manufacturer's Drawing 504-500 and Instructions. Wiring was replaced with new of same gage. This installation was previously approved N2759K (10/9/03) and N72182 (8/27/03). Both aircraft had C-85-12 engines.

Installation was done prior to and is reflected in the weight and balance of the aircraft dated May 14, 2005.

Installation was referenced in engine log.

3. Controls remained unchanged

4. Servicing information is n/a

5.Maintanence Instructions: Every 500 hours time in service or less the drive gear assembly should be checked for backlash per Continental service instructions. This may be done by manual manipulation of the external magnetic housing that rotates with the gear. The drive gear assembly may be serviced in the field by replacement of any required parts per Continental service instructions. Refer to Continental serice bulletin 95-3A. The associjated components require no recurrent maintenance and have an indefinite service life. Minor field adjustment of the regulating voltage may be by use of the external adjusting screw if required.

6. Standard or normal aircraft alternator trouble shooting procedures will apply to identify and repair defective components.

7. For removal and/or replacement information: N/A.

8. Wiring diagrams of the installation are attached.

9. There are no special inspection requirements.

10. Protective treatments is n/a

11. The structural fasteners are n/a

12. Special tools are not required.

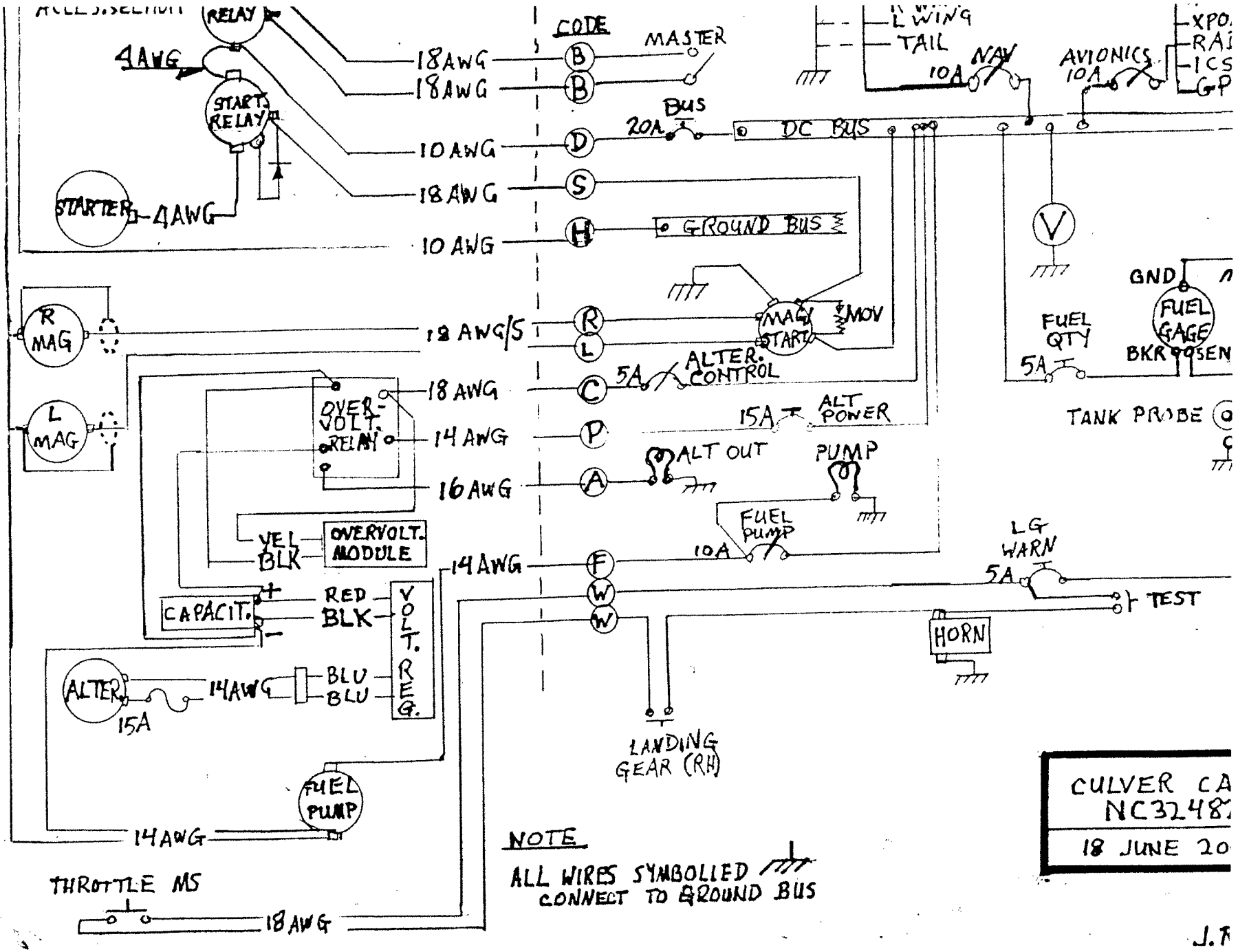
13. Commuter Aircraft is n/a

14.Recommended overhaul period is 2000 hours or at engine overhaul.

15. There are no additional airworthiness limitations.

16. For revision of this ICA, a letter will be submitted to the local FSDO with a copy of the revised form 337 and revised ICA. The FAA inspector accepts the change by signing block 3 and including the following statement: *Major alterations have been accepted by the FAA superceding the instructions for Continued Airworthiness.* Once the revision has been accepted, a maintenance entry will be made identifying the revision, its location, and a date on the form 337.

x Additional Sheets Are Attached


RELAY
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18 AWG
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5A
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OVER-VOLT. RELAY
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P
15A
ALT POWER
16 AWG
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FUEL PUMP
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LANDING GEAR (RH)
FUEL PUMP
14AWG
THROTTLE MS
18 AWG
NOTE
ALL WIRES SYMBOLLED
CONNECT TO GROUND BUS
CULVER CA
NC3248
18 JUNE 20
J.T

SHEET 2

STARTER

US Department of Transportation Federal Aviation Administration	**MAJOR REPAIR AND ALTERATION** **(Airframe, Powerplant, Propeller, or Appliance)**	Form Approved OMB No. 2120-0020 **For FAA Use Only** Office Identification

INSTRUCTIONS. Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in civil penalty not to exceed $1,000 for each such violation (Section 901 Federal Aviation Act of 1958).

1. Aircraft	Make CULVER	Model LCA
	Serial No. [illegible]	Nationality and Registration Mark N32481
2. Owner	Name *(As shown on registration certificate)* ECHO DELTA LTD	Address *(As shown on registration certificate)* 3511 SILVERSIDE RD STE [illegible] WILMINGTON DE 19810-[illegible]

3. For FAA Use Only

4. Unit Identification				**5. Type**	
Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	*(As described in Item 1 above)*				
POWERPLANT	CONTINENTAL	C-85-12	[illegible]		X
PROPELLER					
APPLIANCE	Type Manufacturer				

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency	C. Certificate No.
EDWARD F BYARS 401 RUDDER RIDGE SENECA SC 29678	X	U.S. Certificated Mechanic	[illegible]48089438
		Foreign Certificated Mechanic	
		Certificated Repair Station	
		Manufacturer	

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Date	Signature of Authorized Individual
OCTOBER 19 [illegible]	EDWARD F BYARS [signature]

7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY		FAA Flt. Standards Inspector	Manufacturer	X	Inspection Authorization	Other *(Specify)*
		FAA Designee	Repair Station		Person Approved by Transport Canada Airworthiness Group	

Date of Approval or Rejection	Certificate or Designation No	Signature of Authorized Individual
OCTOBER 19 [illegible]	[illegible]	JOHN R VAN SURDAM [signature]

BACK OF STARTER 337 FORM

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

Installed a B&C model BC 320-1 starter IAW STC SE SE00145WI on N32482, a Culver LCA, sn 215. The engine is a Continental C-85-12, sn 20186-6-12. All work was performed IAW the B&C document #FK501-3 rev E dated February 19, 2003. Wiring was replaced with new of same gauge. A new weight and balance was performed and is dated May 15, 2005.

----------END----------

Additional Sheets Are Attached

STROBE

US Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020

For FAA Use Only
Office Identification

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in civil penalty not to exceed $1,000 for each such violation (Section 901 Federal Aviation Act of 1958).

1. Aircraft	Make: CULVER	Model: LCA
	Serial No.: 215	Nationality and Registration Mark: N32482
2. Owner	Name *(As shown on registration certificate)*: ECHO DELTA LTD	Address *(As shown on registration certificate)*: 3511 SILVERSIDE RD STE 105 WILMINGTOON DE 19819-4902

3. For FAA Use Only

The data ~~falsification~~ identified herein complies with the applicable airworthiness requirements and is approved only for the above described aircraft, subject to conformity inspection by a person authorized in FAR, section 43.7.

OCT 19 2005 (Date) — John W. Sutt SO-FSDO-13 (Signature of FAA Inspector)

4. Unit Identification				**5. Type**	
Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	*(As described in Item 1 above)*				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type / Manufacturer				

6. Conformity Statement

A. Agency's Name and Address	B. Kind of Agency	C. Certificate No.
EDWARD F BYARS 401 RUDDER RIDGE SENECA SC 29678	X U.S. Certificated Mechanic Foreign Certificated Mechanic Certificated Repair Station Manufacturer	248 28 9428

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Date	Signature of Authorized Individual
October 19, 2005	Edward F. Byars Edward F Byars

7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is [x] APPROVED [ ] REJECTED

BY							
		FAA Flt. Standards Inspector		Manufacturer	X	Inspection Authorization	Other *(Specify)*
		FAA Designee		Repair Station		Person Approved by Transport Canada Airworthiness Group	

Date of Approval or Rejection	Certificate or Designation No.	Signature of Authorized Individual
October 19, 2005	238 04 0196	John R. Van Surdam JR Van Surdam

BACK UP STROBE 337 FORM

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

A/C Make: Culver Model: LCA S/N 215 Reg. # N32482

Revision:_____ Date:_____ System:_____

1.Installed Aeroflash Strobe Light System Model 156-0017 in N32482, a Culver LCA, sn 215.

2.Mounted light on bottom of fuselage on Aluminum access panel at station +52 and attached Power Supply pn 152-0007A inside at Station 52. A 10 amp Switch/Circuit Breaker was installed on instrument panel labeled STROBE LT. between unit and 12V bus.

All work was performed IAW Aeroflash instructions 130-0071 dated 12-1-88 and in accordance with practices set forth in AC43.13-1B chapter 11 Sections 3,and 4. Shielded wiring sized per AC43.13-1B table 11-3 was utilized throughout.

The installation guidelines set forth in AC 43.13-2A Chapter 4 were followed. Antenna placement distance relative to the strobe light was maximized to eliminate RFI. The installation meets FAR 23.1301, 1309, and 1383. Bottom of fusealge location was chosen to be out of line of site of crew vision and to insure that the required "field of coverage" was obtained.

A shadowing test was completed in a darkened hangar per AC43.13-2A Chapter 4, Section 56. The system met the "field of coverage" requirements of FAR 23.1401.

A load analysis was performed. The aircraft electrical system capacity (15 amps) ws capable of supporting the maximum aircraft electrical and avionics load of 9 amps.

The aircraft equipment list was updated and an entry in the aircraft log was made to reflect the installation. An operational and system check was performed on all comunication and navigation units to check for interference (RFI). The units worked properly and within manufacturers specifications. The strobe light installation did not adversely affect any existing aircraft system.

Installations were made prior to and are reflected in the weight and balance of aircraft dated May 14, 2005 a copy of which was placed in the aircraft and an entry of same made in the aircraft log.

3. Control: a separate switch/circuitbreaker was mounted on panel between the unit and the 12v bus. An electrical load analysis confirmed that the amperage drawn by the unit is well within the alternator capacity with all other electrical equipment operating.

4 Servicing requires removal of access panel on bottom of fuselage forward of trailing edge of wing. Light and power supply are available therein.

5.Maintenance Instructions: Test for proper operation is required at each annual inspection. Parts replacement may be required at that time or any prior time that improper operation is observed.

6.Trouble shooting information is n/a.

7.Removal and replacement of components must be IAW manufacturer's instructions 130-0071 dated 12-1-88.

8.Diagrams of the installations are not required.

9. There are no special inspection requirements.

10. Protective treatments is n/a

11. The structural fasteners are n/a

12. Special tools are not required.

[X] Additional Sheets Are Attached

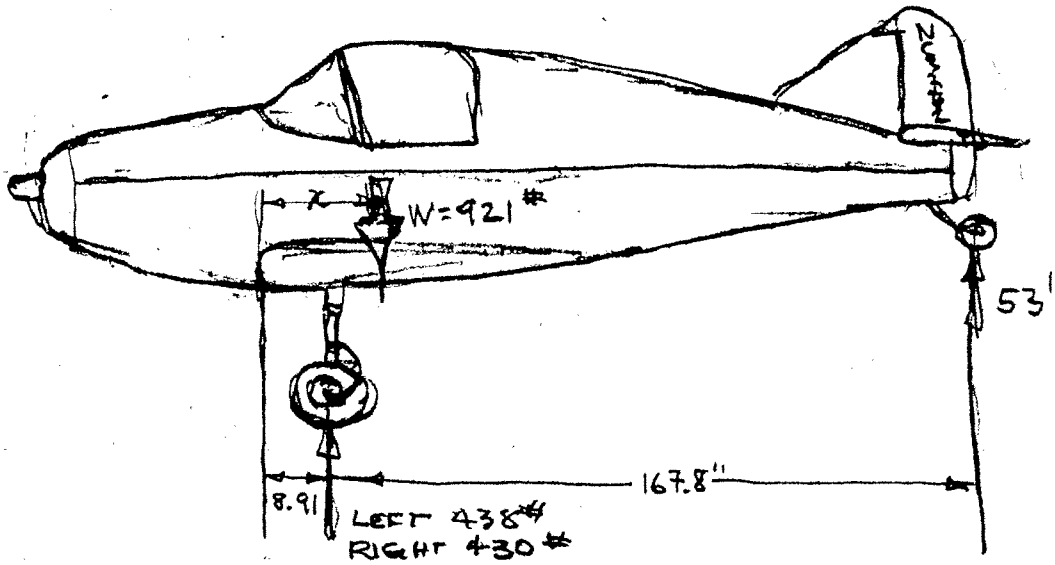
* U.S.G.P.O. 1990-761-753

WEIGHT & BALANCE

CULVER CADET

NC32482 SERIAL #215

5-14



TOTAL WEIGHT 921 #
(EMPTY WEIGHTS)

$$CG = x = 8.91 + \left(\frac{53 \times 167.8}{921}\right) = +18.57"$$

CG LIMITS:
FOWARD +15"
REAR +19.5"

GROSS WEIGHT	1305 #
EMPTY WEIGHT	921 #
USEFUL LOAD	384 #

I CERTIFY ABOVE CORRECT:

Edward F. Byars MAY 14, 2005

EDWARD F BYARS A&P 248-28-9428

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
Budget Bureau No. 04-R060.1

FOR FAA USE ONLY

OFFICE IDENTIFICATION

INSTRUCTIONS Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereo for instructions and disposition of this form.

1. AIRCRAFT	MAKE: Culver	MODEL: LCA
	SERIAL NO.: 215	NATIONALITY AND REGISTRATION MARK: USA N 32482
2. OWNER	NAME (As shown on registration certificate): Babbitt, Joyce A.	ADDRESS (As shown on registration certificate): 475 W. Hillside, Barrington, Ill. 60010

3. FOR FAA USE ONLY

4. UNIT IDENTIFICATION

UNIT	MAKE	MODEL	SERIAL NO	5. TYPE REPAIR	AL AI
AIRFRAME	(As described in item 1 above)				
POWERPLANT	Continental	C-85-12F	20186-6-12		
PROPELLER					
APPLIANCE	TYPE				
	MANUFACTURER				

6. CONFORMITY STATEMENT

A. AGENCY'S NAME AND ADDRESS	B. KIND OF AGENCY	C. CERTIFICATE NO
Richard James Hardin P.O. Box 1303 Gunnison, Co. 81230	X U.S. CERTIFICATED MECHANIC FOREIGN CERTIFICATED MECHANIC CERTIFICATED REPAIR STATION MANUFACTURER	481445572

D. I certify that the repair and or alteration made to the unit(s) identified in item 4 above and described on the revers attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulat and that the information furnished herein is true and correct to the best of my knowledge

DATE	SIGNATURE OF AUTHORIZED INDIVIDUAL
May 13, 1991	R. J. Hardin

7. APPROVAL FOR RETURN TO SERVICE

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribe the Administrator of the Federal Aviation Administration and is ☑ APPROVED ☐ REJECTED

BY						OTHER (Specify)
		FAA FLT. STANDARDS INSPECTOR		MANUFACTURER	✓ INSPECTION AUTHORIZATION	
		FAA DESIGNEE		REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT	

BACK OF AUTO FUEL 337 FORM

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. A alteration must be compatible with all previous alterations to assure continued conformity with th applicable airworthiness requirements.

8. DESCRIPTION OF WORK ACCOMPLISHED *(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)*

1. Aircraft and engine to fly on unleaded automotive gasoline, 87 minimum anti-knock index, per ASTM Specification D-439, in accordance with Supplemental Type Certificate numbers SA913GL and SE634GL.

ENGINEERING ANALYSIS

For

APPLICATION OF CLEVELAND BRAKE KIT No. 199-102 to CULVER LCA

This "Cleveland" brake kit is manufactured by Parker Hannifin Corp, Aircraft Wheel & Brake Division and is TSO Approved under TSO-C26.

Detailed specifications of kit No. 199-102 are given in Cleveland Engineering Drawing No. 50-76 dated 5-28-51. From that drawing it is determined that each wheel of the kit has a Kinetic Energy Capacity of 117,500 ft-lb.

Also from the drawing the relationship is given to determine the Kinetic Energy of an aircraft for a normal deceleration rate of 10 ft per sec per sec.

$$KE = \frac{0.0443 \times W \times V \times V}{N}$$

Where: KE= Kinetic Energy per wheel-brake assembly (ft-lb)
W= Design Landing weight (lbs.)
V= Aircraft Speed (kts), Poweroff stall speed in Landing configuration
N= Number of wheels with brakes

The Culver LCA specifications are: W= 1305 lbs.; V=32kts.; and N= 2.

Therefore, using the above relationship, the required KE for each Culver brake is 29,600 ft-lb.

The 117,500 ft-lb KE available with the chosen kit is more that adequate.

Based on the above analysis it is my professional opinion that the Cleveland kit referenced above is satisfactory for use on the 1305 pound gross weight Culver LCA.

Respectively submitted,

Date: July 7, 2005

Edward F. Byars, PhD
Reg. Prof. Eng. SC #1312
A & P No. 248-28-9428