

CEN21LA047 (N331BW) – Airframe and Engine Examination Report

The wreckage of N331BW (Ercoupe 415-C airplane with a Continental Motors C-85-12 engine) was laid out and examined at Air Salvage of Dallas in Lancaster, Texas, on November 11, 2021. Present during the examination was Mike Hodges, investigator-in-charge, from the NTSB.

Airframe:

- All major components of the airframe were accounted for, after the airframe was laid out.
- There were no signs of a fire.
- Control continuity was established for the airframe (rudder, elevator, ailerons, trim, and there are no flaps are on this model).
- A large hole was cut on the top of the tail boom to facilitate the examination of the flight control cables.
- The left and right fuel tanks were breached from the accident sequence. The main (nose) tank appeared intact. The right fuel tank had a standard fuel cap installed. The left tank had an external sight valve cap installed, that appeared to be damaged and missing from the accident sequence. The main (nose) tank had an external sight valve cap installed, which was intact. The right and left caps were found installed. The main cap was found not installed.
- The fuel lines did not appear to be blocked.
- No signs of fuel were found in the wreckage.
- Airframe to engine control continuity was established.
- The airplane did have an outside air temperature gauge installed, but a carburetor temperature gauge was not installed.
- The throttle control was found extended about halfway out and was bent upwards at about a 90-degree angle from the accident sequence.
- The primer, mixture, and carburetor heat controls were found all the way in.
- The cockpit was equipped with two lap belt restraints, both restraints were found intact and locked when tested onsite.
- The ELT was removed from the cabin for examination.
- The nose wheel was attached but was damaged. The left and right main landing gear were both attached.
- The cabin, starting at where the two seats are, to the firewall, was crushed from impact damage.
- Both left and right fuel tanks were found separated from their respective wing.
- Both wings sustained impact damage and the wing spar bolts were removed to facilitate recovery after the accident.
- No onboard recording devices were found.
- The airframe records were documented.

Engine:

- The cowlings were removed to facilitate the examination.
- The engine mounts were found intact and secured to the airframe except for the lower mount that connects to the nose wheel, which was damaged from the impact sequence.
- The cylinders and crankcase all appeared intact.
- There were no signs of a fire.
- All the engine accessories appeared to be attached to the engine, however some sustained damage from the accident sequence.
- The fuel and oil lines appeared to be secure.
- A large amount of oil leaked out when moving the engine (after the rocker covers were removed).
- The top and bottom spark plugs were removed for examination. All spark plugs showed normal operation signatures consistent with the Champion Check a Plug chart.

- The crankshaft was able to be rotated by hand with no issues noted. The impulse couplers made a noise when the crankshaft was rotated.
- During the crankshaft rotation, all pistons within the cylinders appeared to be moving. The rocker arms on all cylinders for the intake and exhaust appeared to be moving equally.
- Thumb compression was obtained for each cylinder.
- The number 3 cylinder thumb compression seemed a bit low compared to the other cylinders, however the front push rod was found damaged (pushed in) from the impact sequence.
- Both magnetos did not spark while attached to the engine. Both magnetos were removed from the engine and connected to a drill. Both magnetos produced spark at each 4 leads, for each one (8 leads total). The ignition harness leads sustained impact damage.
- The air intake system was damaged from the accident sequence.
- The exhaust system was damaged from the accident sequence on both sides. This model does not have internal exhaust baffles installed, just a hollow tube.
- This model does not have a propeller governor.
- The oil tank cap was found intact.
- The oil tank was damaged from the accident sequence but appeared to be intact.
- The oil filter can was removed, and the filter material was cut open. No debris was noticed inside of the filter material.
- The induction system tubing, that attaches to the carburetor was found fractured from the accident sequence.
- The carburetor was removed and disassembled. No debris was noticed in the screen. The float appeared to be intact, not damaged, and moved up and down. No debris or blockages were noted with the carburetor.
- The airframe to engine fuel bowl was removed and documented. A small amount of corrosion was present at the bottom of the bowl, appearing to be from possible water.
- The propeller was removed and documented. Blade 1 was slightly bent after. Blade 2, about midspan, was bent backwards about 090 degrees.
- The spinner was crushed and was partially rotated from the impact damage.
- The engine and propeller records were documented.

Summary:

During the examination, no preimpact mechanical malfunctions or failures were noted with the airframe and engine.

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YEAR: DATE	RECORDING TACH TIME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	Description of Inspections, Tests, Repairs and Alterations Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair Facility. (See back pages for other specific entries.)

10-29-2020 Tach Time 603.07 Total Time 1881.07.
Installed new Concord RG-35AXC, S/N 41114505.
Serviced fuel strainer. ELT tested as per FAR 91-207.
Packed wheel bearings. Lubed pulleys, bell cranks and
hinge points. Installed new Brackett air filter element.
A.D.2012-08-06 inspected visually due 2027 or 2000
hours. I certify that this aircraft has been inspected in
accordance with an annual inspection and has been
found to be airworthy. Charles Gregory Lucas
A&P [REDACTED] IA [REDACTED]

S, TESTS, REPAIRS AND ALTERATIONS
NAME, RATING AND CERTIFICATE NUMBER OF
BACK PAGES FOR OTHER SPECIFIC ENTRIES.)

#2, #4 Cylinders
Chamber Replaced
Piston Assembly, Gibson
Piston Cylinders
Test Pass
this engine

DATE	RECORDING TACH TIME	TODAYS FLIGHT	TOTAL TIME IN SERVICE
19__			

DESCRIPTION OF INSPECTIONS, TESTS, REPAIRS AND ALTERATIONS
ENTRIES MUST BE ENDORSED WITH NAME, RATING AND CERTIFICATE NUMBER OF
MECHANIC OR REPAIR FACILITY. (SEE BACK PAGES FOR OTHER SPECIFIC ENTRIES)

10-29-2020 Tach Time 603.07. 1610.07 SMOH.
Compressions #1-74/80, #2-79/80, #3-65/80, #4-78/80.
Drained oil and removed oil filter, filter cut open no
contaminates found. Installed new AA48108-2 oil filter
and 4 qts Aeroshell 100W oil. Cleaned and tested spark
plugs. set mag timing 30 degrees BTC on left and 28 BC
on right. A.D.98-17-11 N/A. I certify that this engine
has been inspected in accordance with a
100hour/annual inspection and has been found to be
airworthy. Charles Gregory Lucas A&P [REDACTED] IA
[REDACTED]

Carburetor Icing Probability Graph – CEN21LA047

Airplane: Ercoupe 415-C

Engine: Continental Motors C-85-12

Carburetor: Stromberg NA-S3A1

Fuel: 100 Low Lead

Accident Date: 11/07/2020

Accident Location: Ardmore, OK

Accident Time: 0830 CDT

Weather: K1F0 071415Z AUTO 14003KT 10SM CLR 13/11
A3013 RMK AO2 T01300111

Celsius to Fahrenheit Conversion:

Temperature, 13° C = 55.4° F

Dew Point, 11° C = 51.8° F

Source: Federal Aviation Administration

Special Airworthiness Information Bulletin CE-09-35

Carburetor Icing Prevention



FAA AIRCRAFT REGISTRY

CAMERA NO. 4N DATE: 8/9/82

ENGINEERING AND RESEARCH CORPORATION
WEIGHT AND BALANCE
Manufactured under Production Certificate #17

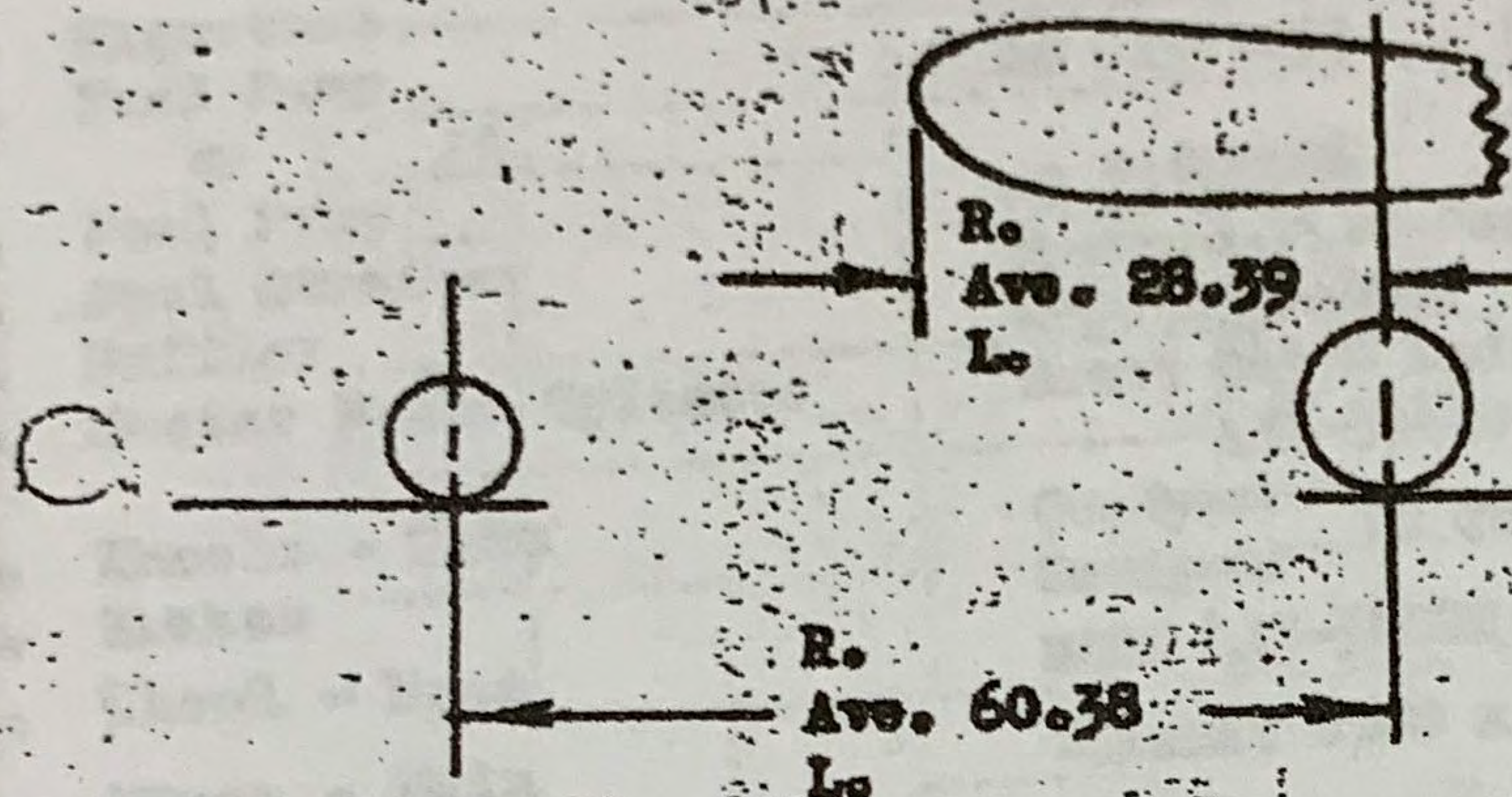
ERCOULE Model 415-G

Date of Manufacture 8-21-48

U. S. 88488

Engine No. 2279-G-12

Serial No. 2093



Datum is Firewall
L. E. W. is 15.75 aft datum

Weight Data		
Position	Net	
	Actual	Computed
Rear No.		285
Rear L.		288
None		230
TOTAL		803

Useful Load 457 #

Empty Weight Horizontal C. G.
11.10 Aft L. E. W.
26.85 Aft Datum

EXTREME C. G. POSITIONS						
Forward C. G.				Rearward C. G.		
	Weight	Arm	Horizontal Moment	Weight	Arm	Horizontal Moment
Empty Weight Actual Computed	803	26.85	21561	803	26.85	21561
Pilot	170	37	6290	170	37	6290
Gasoline - Fuselage Tk.	30	7	210	30	7	210
Gasoline - Wing Tk. R.	54	25	1350	42	25	1050
Gasoline - Wing Tk. L.	54	25	1350	25	25	-112
Oil	8	14	-112	8	14	-112
Passenger		37		170	37	6290
Baggage		57		37	57	2109
Total	1119		30649	1260		37398
H. C. G. inches aft ref.		27.39			29.68	
H. C. G. % MAC		18.9			22.9	

L. E. W. is 16.6 aft of datum
H. A. C. is 57.1 inches

Approved C. G. Limits Fwd. 26.4" aft ref.
Rwd. 30.3" aft ref.

BAGGAGE ALLOWANCE

- Pilot and no passenger.....65
- Pilot and passenger (max. fuel).....0
- Pilot and passenger (min. fuel).....37
- Max. Baggage Never to Exceed.....65
- Minimum Fuel.....12 gal.

Weight and Balance Engineer

Approved by

Inspector for the Authority

Verified by

002

FAA AIRCRAFT REGISTRY
CAMERA NO. 4N DATE: 8/9/82

Woodly Aerospace, KS
415C

Boeing Model 415-3

STANDARD - Installed on all Airplanes:

Item	Make and Model	Unit Wgt.-#	Arm"
1. Engine	Continental C75-12	165.81	-22
2. Propeller	Sensenich 100000 14PK148	11.00	-32.5
3. Carburetor	Stromberg NAS 3AL	2.60	-19
4. Air Filter	Heath #100 Modified as per 415-40533	2.41	-21.5
5. Magneto	Elasmann LA-4	7.00	- 8.00
6. Fuel Pump	AN #1539051	1.703	-27.38
7. Fuel Pump	AC #1525066	1.703	-27.38
8. Fuel Strainer	Rygrade-Filt-Pure	.531	-16.50
9. Muffler	ERCO 415-40517	4.13	- 2.25
10. Master Brake Cylinder	Scott #1350 Modified as per 415-33419	.825	3.81
11. Wheels - Main	Goodyear PD 280 (6.00 x 6)	2.813	44
12. Brakes	Goodyear	1.344	44
13. Wheel - Nose	ERCO 415-31202 and 415-31207	2.50	-16
14. Tires - Main	Shenuit 6.00 x 6	5.75	44
15. Tire - Nose	Shenuit 5.00 x 4	4.83	-16
16. Tubes - Main	Shenuit 6.00 x 6	2.00	44
17. Tube - Nose	Shenuit 5.00 x 4	1.98	-16
18. Navigation Light - Wing	Grimes Model "C" ATC #20	.469 ea.	37.13
19. Navigation Light - Tail	Grimes Model "C" ATC #20	.425	201.88
20. Master Switch	AN-3023-2	.200	56.25
21. Control Wheel	Decker #1020-ATC160	.926	27.75
22. Spinner	ERCO 415-40498	.460	-32.5
23. Junction Box	Aircraft-Marine Products #40099	.046	52.25
24. Instrument Panel		13.6346	21.63
1. Tachometer	Stewart-Warner #557-6V	.8340	
2. Oil Temperature	Stewart-Warner #112252	.627	
	#112007	.565	
3. Oil Pressure	Stewart-Warner #91227	.289	
	#114006	.267	
4. Compass	Airpath Type C-1100	1.237	
	Aero-Marine #511 N	1.060	
5. Altimeter	Aero-Marine #520 N	.500	
6. Circuit Breaker	Cutler-Hammer #8750	.150	
7. Ignition Switch	Decker #3267-A	.615	
8. Primer	Parker No. 4045	.211	
	Lunkenheimer #14010	.630	
9. Airspeed Indicator	Aero-Marine #510 N	.583	
10. Ammeter	Stewart-Warner #1140089	.650	
	#95245	.289	

SPECIAL:

Item	Make and Model	Unit Wgt.-#	Arm"	Installed on this Airplane
1. Starter	Delco-Remy #110956	13.75	- 7	Yes
2. Generator	Delco-Remy #1101876	9.77	- 8	Yes
3. Battery	Reading R24L	24	-55	Yes
4. Voltage Regulator	Delco-Remy CR 43424	1.5	-50	Yes
5. Sunshade	ERCO 415-55053	2.56	42	Yes

Date: Aug. 10, 2010

OPERATING LIMITATIONS

CAR Part 4a; 4a.504

ERCOUPE 415C - CD

SN 2091 , FAAN 331BW

ENGINE LIMITS	<u>2575</u> MAXIMUM RPM
AIRSPEED LIMITS	108 MPH; MANEUVERING SPEED 114 MPH; MAXIMUM STRUCTURAL CRUISING 144 MPH; NEVER EXCEED SPEED
MAXIMUM WEIGHT	1320.00 lbs.
EMPTY WEIGHT	<u>832</u> lbs.
USEFUL LOAD	<u>488</u> lbs.

DATUM FACE OF FIREWALL

CENTER OF GRAVITY RANGE 26.4" TO 30.3"

EMPTY CENTER OF GRAVITY 27.2

SPECIAL LIMITATIONS "This airplane is characteristically incapable of spinning"

Signed

Paul Gardner

Date Aug. 10, 2010

Note - To be approved by an FAA Inspector or IA authorized mechanic.

CEN21LA047 (N331BW – Ercoupe 415-C) – Weight and Balance Calculations

Item	Weight	Arm	Moment
Basic Empty Weight	832	26.85	22,339.2
Pilot (Left Seat)	200	37	7400
Passenger 1 + 2 (Same Seat - Right)	190	37	7030
Fuel - Fuselage (Max)	30	7	210
Fuel - Left Tank (Max)	54	25	1350
Fuel - Right Tank (Max)	54	25	1350
Oil	8	-14	-112
Baggage*	Unknown	Unknown	Unknown
Totals	1368	NA	39,567.2

$$39,567.2 \div 1368 = 28.92339$$

Maximum weight: 1,320 pounds

Total weight at engine start: 1,368 pounds (48 pounds over the limit)

Center of gravity range: 26.4" to 30.3"

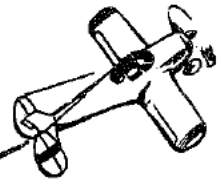
Center of gravity at engine start: 28.92"

*Per the manufacturer's weight and balance sheet, zero pounds of baggage is allowed with a pilot, a passenger, and a maximum fuel load.

Ercoupe INFORMATION

ERCOUPE
INFORMATION
LETTER
No. **2**

SUBJECT: Model C Flight Manual



The Model 415-C, having been manufactured under Part 04 of the C.A.R., does not employ a flight manual, and none is available. Supplement No. 6 of F.A.A. No. 43 dated August 15, 1942, requires that Operation Limitations formerly included in their form ACA 309 or 309A be accessible to the pilot at all times in a manner which is legible and is not easily erased or disfigured. The following information is required:

REQUIRED INFORMATION FOR 75-H.P. MODEL 415-C

Engine Limits	2275 r.p.m.
Airspeed Limits	108 m.p.h. maneuvering speed
	114 m.p.h. maximum structural cruising
	144 m.p.h. never exceed
Maximum Weight	1260 lbs.
Empty Weight	To be determined for individual airplane
Useful Weight	To be determined for individual airplane
Datum	Forward face of firewall
Center of Gravity Range	26.4" to 30.3"
Empty Center of Gravity	To be determined for individual airplane
Any Special Limitations	"This airplane is characteristically incapable of spinning"

This information is to be made out and signed by the local D.A.M.I. or F.A.A. inspector.

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

A-718
Revision 29
Univair
(Mooney)
(ERCO) 415-C
(ERCO) 415-CD
July 14, 2005

AIRCRAFT SPECIFICATION NO. A-718

Type Certificate Holder: Univair Aircraft Corporation
[REDACTED]
Aurora, Colorado 80011

I. - Model 415-C, 2 PCLM (Normal Category), Approved March 25, 1940

Model 415-CD, 2 PCLM (Normal Category) . Approved August 19, 1947

S/N 113 thru 4423 similar to previous S/N except for installation of 75 hp. engine, increased design speeds, revised brake, primary control system and windshield and changes in fabrication methods.

S/N 4501 and up designated model 415-CD identical to model 415-C except for revised throttle and trim control, wide trim tab (1-3/8 in. chord) in accordance Erco dwg. 415-22031, improved fuel venting system, revised nose gear oleo strut, improved interior trim and installation of stainless steel upper fuselage skin.

Engine	Continental A-65-8 (aircraft S/N 1 thru 112) Continental C-75-12 or -12F (aircraft S/N 113 and up) See items 102, 103, 106, and 110 for optional engines.
Fuel	73 min. octane aviation gasoline
Engine limits	For all operations, 2300 r.p.m. (65 hp.) (S/N 1 thru 112) For all operations, 2275 r.p.m. (75 hp.) (S/N 113 and up)
Airspeed limits	Level flight or climb 117 m.p.h. (102 knots) True Ind. (S/N 1 thru 112) Glide or dive 144 m.p h. (125 knots) True Ind. Level flight or climb 120 m.p h. (104 knots) True Ind. (S/N 113 and up) Glide or dive 144 m.p h. (125 knots) True Ind.
C. G. range	(+26.4) to (+30.3)
Empty wt. C.G. range	(+25.2) to (+25.8) with 65 lb. baggage capacity (+25.2) to (26.6) with 40 lb. baggage capacity Ranges not valid for nonstandard arrangements. (Optional fuel tanks items 108 and 113 do not affect the ranges). When empty wt. C.G. falls within the pertinent range, computation of critical fore and aft C.G. positions is unnecessary.
Maximum weight	1260 lb.
No. of seats	2 (+37)
Maximum baggage	65 lb. (+57)
Fuel Capacity	14 gal. (one 9 gal. wing tank at +25, one 5 gal. fuselage tank at +7). See items 108 and 113 for optional tanks.
Oil capacity	4 qt. (-14)
Control surface movements	Serial Nos. 113 and up: (S/N 112 and below not available) Elevator Up 13° Down 12° Aileron Up 40.5° Down 9.5° Rudders Outboard 20° Inboard 3°
Serial Nos. eligible	1 thru 4423, 4500 and up
Required equipment	S/N 1 thru 112: 9, 104(b), 105(b), 201(b), 202(a) or (b) S/N 113 thru 812: 3, 104(c), 105(c), 106, 201(a), 202(a) or (b) S/N 813 and up: 3, 102(b), 104(c), 105(c), 106, 202(b)

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Rev. No.	29	29	28	28	29	28

SPECIFICATIONS PERTINENT TO ALL MODELS

Leveling means	Hatch sill on either side of fuselage
Datum	The firewall bulkhead
Certification basis	Part 4a of the Civil Air Regulations Type Certificate No. 718 issued March 25, 1940 Application for Type Certificate dated April 20, 1938
Production basis	None. Prior to original certification of each aircraft, an FAA representative must perform a detailed inspection for workmanship, materials and conformity with the approved technical data and a check of the flight characteristics.
Export eligibility	Eligible for export to all countries subject to the provisions of FS P 8130.1, except as follows: Canada - Landplane and skiplane eligible
Equipment	A plus (+) or minus (-) sign preceding the weight of an item indicates net weight change when that item is installed. Approval for the installation of all items of equipment listed herein has been obtained by the aircraft manufacturer except those items preceded by an asterisk (*). This symbol denotes that approval has been obtained by someone other than the aircraft manufacturer. An item marked with an asterisk may not have been manufactured under an FAA monitored or approved quality control system, and therefore conformity must be determined if the item is not identified by a Form FAA-186 or 8130-3 Airworthiness Approval Tag, TSO, PMA or other evidence of FAA production approval.

Propellers and Propeller Accessories

- Propeller - Beech controllable, R002 or R003 with blades as follows:
(See NOTE 6 of Propeller Spec. P-804 for interchangeable blades) 26 lb. (-35)
 - With Continental A-65 engine: R002-205-72
 - With Continental C-75 or C-85 engine (see item 106 or 110)
R-003-72 or R003-225-72
Diameter: not over 72 in., not under 70.5 in. (a) and (b)
Pitch settings at 27 in. sta.:

	<u>Low</u>	<u>High</u>
(a) With Continental A-65 engine	12-1/2°	19-1/2°
(b) With Continental C-75 engine	12-1/2°	21-1/4°
(c) With Continental C-85 engine	13° to 14°	18.5° to 20.5°

Note: With C-85 engine (item 110) the following additional Ercoupe engine baffles are required:
Erco P/N 415-40487, left and right; 415-40488, one; 415-40597, two; 415-40598, two.
Check aircraft weight and balance to determine if ballast required in cargo compartment when aircraft flown solo.
- Propeller control 1 lb. (-10)
Propeller - fixed pitch metal, McCauley 1A90CF or 1B90CM 26 lb. (-32)
 - With Continental C-75 series engines only
Static r.p.m. at maximum permissible throttle setting:
not over 2100, not under 1950. No additional tolerance permitted.
Diameter: not over 73 in., not under 71 in.
 - With Continental A-65 series engines only
Static r.p.m. at maximum permissible throttle setting:
not over 2260, not under 2110. No additional tolerance permitted.
Diameter: not over 74 in., not under 72.5 in.
- Propeller with Continental C-75 or C-85 series engines 15 lb. (-32)
Sensenich 74FC (pitch 48 to 52 in.) (including hub) or any fixed pitch wood propeller eligible for engine speed and power which meet static r.p.m. and diameter limits as follows:
S/N 113 and up.
Static r.p.m. at maximum permissible throttle setting: not over 2100, not under 1850. No additional tolerance permitted.
Diameter: not over 74 in., not under 72 in.

- | | | | |
|-----------|---|--------|---------|
| 4. | Propeller - Koppers Aeromatic F200 hub with 00-73E or 00-73F blades.
No change in parts list assembly may be permitted without FAA engineering approval. | 28 lb. | (-32.5) |
| (a) | With Continental C-75-12 engine
Diameter: not over 73 in., not under 71.5 in.
Pitch setting at 24 in. sta.: low 13°, high 20.3°
Parts list assembly No. 4305 | | |
| (b) | With Continental C-85-12 engine
Diameter: not over 73 in., not under 71.5 in.
Pitch settings at 24 in. sta.: low 11°, high 20° min.
Parts list assembly No. 4305A | | |
| 5. | Propeller - Two-position controllable, Sensenich C2FB1 with blades PC276A6-2 (weight includes pitch control)
Diameter: not over 76 in., not under 74.5 in.
Pitch: low 11.5°, high 15.5°
May be installed only with Continental C-75-12FH engine which has oil passages used to operate this propeller. Following placard required:
"Before stopping engine put pitch control in high to drain oil out of control cylinder." | 29 lb. | (-32) |
| 6. | Propeller - ground adjustable, Hartzell, hub HA12UO or HA12UF, blades 7414 to 7014 or 7214M, eligible on all engines with static r.p.m. and diameter limits shown for fixed pitch wood propellers. | 18 lb. | (-32) |
| 7. | Propeller - fixed pitch metal, McCauley 1A90-CF or 1B90CM (with engine item 110 only). Static r.p.m. at maximum permissible throttle setting: not over 2225, not under 2025. No additional tolerance permitted.
Diameter not over 71 in., not under 69.5 in. | 26 lb. | (-32) |
| 8. | Propeller - fixed pitch metal, Sensenich M76AK-2 | 24 lb. | (-32) |
| (a) | With C-75 engines only.
Static r.p.m. at maximum permissible throttle setting: not over 2125, not under 2050. No additional tolerance permitted.
Diameter: not over 74 in., not under 72.5 in | | |
| (b) | With C-85 engines only.
Static r.p.m. at maximum permissible throttle setting: not over 2250, not under 2175. No additional tolerance permitted.
Diameter: not over 74 in., not under 72.5 in | | |
| <u>1/</u> | 9. Propeller - wood (fixed or adjustable pitch) (including hub) (Continental A-65 engines)
Static r.p.m. at maximum permissible throttle setting: not over 2310, not under 2110. No additional tolerance permitted.
(Aircraft S/N 1 thru 112) | 14 lb. | (-32) |

Engines and Engine Accessories

- | | | | |
|-----------|---|---------|-------|
| <u>2/</u> | 102. (a) Continental A-65-7. No airplane eligible for original certification with single ignition engine after 8-1-41. | -10 lb. | |
| | (b) Continental A-65-9J. Propeller static r.p.m. at maximum permissible throttle setting, not over 2210, not under 2110. No additional tolerance permitted. | +6 lb. | |
| <u>3/</u> | 103. Continental A-65-9 | +3 lb. | |
| | 104. Carburetor air heater | | |
| | (a) Deleted 7-10-46 | | |
| | (b) Per dwg. 40033-34 with A-65 engine | 5 lb. | (-12) |
| | (c) Per dwg. 415-40517 with C-75
(Two separate muffers for carburetor and cabin heat in place of single dual-purpose muff previously used) | 5 lb. | (-2) |
| 105. | Fuel pumps | | |
| | (a) Deleted 7-10-46 | | |

	(b) AC CP-8527 with A-65 engine installed	5 lb.	(-12)
	(c) Following fuel pumps are eligible with C-75 engines: AC P/N 1539051 Continental P/N 40585 AC P/N 1539076 Continental P/N 40695 AC P/N 1539003 Continental P/N 40281 AC P/N 1537973 Continental P/N 40452		
106.	Continental C-75-12 or C-75-12F Eligible on S/N 113 and up at limits indicated for those S/N. S/N 46 thru 112 (model 415-C) also eligible with this engine with limits noted for S/N 113 and up, provided engine installation and cowling are in accordance with manufacturer's dwg. S/N 1 thru 45 (model 415-C) are also eligible with this engine provided engine installation and cowling are in accordance with manufacturer's drawings and provided large front spar web reinforcement plate is installed at both center panel and outer panel wing hinge fittings.	+12 lb.	
107.	Starter Delco-Remy No. 1109656, P/N 50309 (Continental C-75-12 and -12F engines only).	16 lb.	(-7)
108.	Two wing fuel tanks, Erco dwg. 415-48197L/R (7.7 gal. ea.) These tanks are eligible as field replacement for standard 9 gal. tanks on S/N 813 and up. With these tanks installed fuel capacity is 20.4 gal.	-5 lb.	(+25)
109.	Oil filter, Fram PB-5, Kit No. K-510 Fram installation dwg. 61614.	5 lb.	(-2)
110.	Engines Continental C-85-12 or -12F Engine limits for all operations: 2575 r.p.m. (85 hp.) (Eligible with item 1(c), 3, 4, 6, 7, or 8 propeller only). Eligible on model 415-CD; eligible on model 415-C provided the following are accomplished: (a) Modifications specified under item 106 for installation of C-75 engine. (b) Wide elevator trim tab (1-3/8 in chord) installed per Erco dwg. 415-22031 or narrow trim tab (3/4 in. chord) installed per Erco dwg. 415-22027 (or item 401). Note: Conversion of continental C-75 engine to C-85 must be accomplished in accordance with Continental Service Bulletin M47-16, dated 6-7-48 and the oil sump dip stick recalibrated to indicate full when sump serviced with 4.5 qt. oil.	12 lb.	
111.	Baffle plate, Erco P/N 415-40252 (optional with all engines).	Negligible weight	
*112.	Davis exhaust silencer - model D-75-85ER installed per Davis Silencer Co. dwg. S-75-85ERI.	2 lb.	(-19.5)
4/	113. Auxiliary left wing fuel tank (S/N 46 and up)	7 lb.	(+25)

Landing Gear

5/	201. (a) 8.00-4 wheels and brakes (Goodrich-formerly Hayes) with 7.00-4 4-ply tires (S/N 1 thru 812)	28 lb.	(+44)
	(b) 6.00-6 wheels and brakes (Goodyear) with 6.00-6 4-ply tires (aluminum alloy forged type landing gear, S/N 813 and up).	28 lb.	(+44)
6/	202. One nose wheel, Type III with 4-ply rating tire and regular tube.		
	(a) Goodrich (Hayes) 5.00-4, model 450M, assembly D-3-164-M (double fork nose gear)	9 lb.	(-16)
	(b) Erco 5.00-4 assembly No. 415-34204 (single fork nose gear)	No weight change	
	(c) Firestone 5.00-5 model DFA531, assembly (Requires revised nose wheel fork Erco Dwg. 415-34360)	No weight change	

	(d) Goodyear 6.00-6 model L6NBD, assembly No. 511500-M (Requires revised nose wheel fork, Erco dwg. 415-34365)	+6 lb.	(-16)
203.	Skis (eligible on all models provided propeller installation meets the minimum 9 in. ground clearance. Maximum weight for skiplane will be the same as for the corresponding landplane or that shown in parenthesis after each ski model, whichever is less.) Federal A-1500 (Maximum 1500 lb.)	Use act. wt.	change
*204.	Wilson Fendaire model LW-1 (nose-wheel only). Installed in accordance with Wilson Fendaire Co. instructions dated 6-2-50.	1 lb.	(-16)
7/ 205.	(a) 7.00-4 2-ply tires (b) 6.00-6 2-ply tires		

Electrical Equipment

301.	Radio	Use act. wt.	change
302.	Batteries For list of approved batteries with their arms and weights, see Univair Service Memorandum No. 67		Use act. wt.
303.	Generator - wind-driven	7 lb.	(+64)
304.	Antenna and miscellaneous	Use act. wt.	change
308.	Generator (a) Delco-Remy 1101876, P/N 40435 (Continental C-75-12 engine only)	10 lb.	(-8)
*309.	Two landing lights (Aviation Accessories Corp. Model E) (Installed in accordance with ACA dwg. E-1001)	4 lb.	(+29)
310.	Two landing lights installed in accordance with Sanders Aviation Company dwg. 415-54108 and installation instructions SK 28.	3 lb.	(+29)

Interior Equipment

401.	Elevator trim tab per Erco dwg. 415-52070		
402.	Trim-O-Matic control kit installed in accordance with Ercoupe Service Memo No. 54 and Erco dwg. 415-52175.	Negligible weight	
403.	Rudder pedals installed in accordance with Erco Kit instructions, Service Memos Nos. 59 and 59A, and dwg. 415-52389. Eligible on S/N 113 and up. (See NOTE 2 for placard).	6 lb.	(+18)

Miscellaneous (not listed above)

*601.	Metal plating of wings per Tech. Instruction Report 103000 by Birtcraft Eng. Co., 11836 Cherry Ave., Inglewood, CA.	32 lb.	(+36)
*602.	Metal wing skin installed per Ruleto Industries, Inc., 4823 Rosecrans Ave., Hawthorne, CA dwg. R-1011, R-1012 and installation instructions EWK-l.	Use act. wt.	change
*603.	Metal wing skin installed per Met-Co-Aire, Fullerton, CA dwg. 41501	Use act. wt.	change

Special Note:

So that all equipment items might be in their proper categories, seven items were moved from one category to another and re-numbered as follows:

- 1/ Item 9 was formerly item 101.
- 2/ Item 102 was formerly item 201.
- 3/ Item 103 was formerly item 305.
- 4/ Item 113 was formerly item 202.
- 5/ Item 201 was formerly item 102.
- 6/ Item 202 was formerly item 103.
- 7/ Item 205 was formerly item 306.

NOTE 1: Current weight and balance report together with list of equipment included in certificated empty weight and loading instructions when necessary must be provided for each aircraft at the time of original certification.

NOTE 2: The following placards required on instrument panel in full view of pilot:

For S/N 112 and below:

“This aircraft characteristically incapable of spinning.”

“Eligible with either two or three controls. Rudder pedals must be removed when operated as two control aircraft.”

For S/N 113 and up:

“This aircraft characteristically incapable of spinning.”

When Sensenich propeller item 5 installed:

“Before stopping engine put pitch control in high to drain oil out of pitch control cylinder.”

When item 403 rudder pedals installed, either of the following placards is required:

“This aircraft characteristically incapable of spinning,” or

“Intentional spins prohibited.”

NOTE 3: S/N 113 thru 4423, and 4500 and up are also eligible as model 415-D under terms of Aircraft Specification A-787, provided the following requirements are met:

(a) Correct propeller and propeller limits.

(b) Correct control surface travel for the elevator.

(c) Incorporates elevator tab in accordance with Erco dwg. 415-22031
(applies to S/N 113 thru 4423 only).

(d) Instruments should be marked in accordance with FAA approved operating limitations.
(Applies to S/N 113 thru 4423 only).

(e) Include placards on the instrument panel in accordance with NOTE 2 of Aircraft Specification No. A-787.

(f) The orifices for the main and nose gear piston should be revised as follows:

	<u>Serial Numbers</u>	<u>Orifice Size</u>
Main Gear	113 thru 812	.067" diameter
Nose Gear	113 thru 1622	.281" diameter

(g) Approved FAA Flight Manual must be carried in the airplane.

(h) “No Smoking” placard should be included in the cabin.

(i) Nameplate should be altered to indicate the date of conversion, new model number, and type certificate number.

(j) Install stainless steel upper skin in fuselage aft of firewall in accordance with Erco dwg. 415-31245.
(Applies to S/N 113 thru 4423 only).

.....END.....

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 91

[Docket No. FAA-2011-0628]

Clarification of Prior Interpretations of the Seat Belt and Seating Requirements for General Aviation Flights

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Clarification of prior interpretations.

SUMMARY: This action clarifies prior interpretations of FAA's seat belt and seating requirements. These prior interpretations state that the shared use of a single restraint may be permissible. This clarification states that the use of a seat belt and/or seat by more than one occupant is permitted only if the seat usage conforms to the limitations contained in the approved portion of the Airplane Flight Manual (AFM). In addition, before multiple occupants use the same seat and/or seat belt, if the pertinent information is available, the pilot in command (PIC) must also check whether: The seat belt is approved and rated for such use; and the structural strength requirements for the seat are not exceeded. This clarification also emphasizes that, because it is safer for each individual person to have his or her own seat and seat belt, whenever possible, each person onboard an aircraft should voluntarily be seated in a separate seat and be restrained by a separate seat belt.

DATES: May 24, 2012.

FOR FURTHER INFORMATION CONTACT: Alex Zektser, Attorney, Regulations Division, Office of Chief Counsel, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591.

SUPPLEMENTARY INFORMATION:

Background

On March 22, 2009, a Pilatus PC-12/45 descended and impacted the ground near the approach end of a runway at Bert Mooney Airport in Butte, Montana. After investigating this incident, the National Transportation Safety Board (NTSB) determined the following.

At the time of the impact, the Pilatus PC-12/45 airplane was operating as a personal flight under the provisions of 14 CFR part 91. The pilot and the 13 airplane passengers were killed, and the airplane was destroyed by impact forces and the postcrash fire. Among the 13

passengers were six adults and seven children. Because the flight was a single-pilot operation, eight seats in the cabin and one seat in the cockpit were available to the 13 passengers. Thus, the number of passengers exceeded the number of available seats. The NTSB was unable to determine the original seating position for most of the occupants, but the bodies of four children, ages 3 to 9 years, were found farthest from the impact site, indicating that these children were likely thrown from the airplane because they were unrestrained or improperly restrained. The NTSB noted that if the accident had been less severe and the impact had been survivable, any unrestrained occupant or occupants sharing a single restraint system would have been at a much greater risk of injury or death.

NTSB Request and Proposed Clarification

As a result of the March 22, 2009 incident described above, the NTSB has requested that the FAA withdraw its prior interpretations of 14 CFR 91.107(a)(3), which permit the shared use of a single restraint system. In response to the NTSB's request, the FAA proposed to clarify that § 91.107(a)(3) permits multiple occupants to use one seat belt and/or seat, but that such use is only appropriate if: (1) The belt is approved and rated for this type of use; (2) the structural strength requirements for the seat are not exceeded; and (3) the seat usage conforms with the limitations contained in the approved portion of the AFM (14 CFR 23.1581(j)).

The FAA received six comments in response to its proposed clarification. After considering the information provided in the comments, the FAA clarifies its prior interpretations of the seat belt and seating requirements of 14 CFR 91.107(a)(3) as follows.

Discussion of the Final Clarification

For part 91 operations, § 91.107(a)(3) requires that "each person on board a U.S. registered civil aircraft * * * must occupy an approved seat or berth with a safety belt and, if installed, shoulder harness, properly secured about him or her during movement on the surface, takeoff, and landing." For commercial operations under part 121, § 121.311 requires that each person "occupy an approved seat or berth with a separate safety belt properly secured about him." Under both parts, children under the age of two may be held by an adult who is occupying an approved seat or berth and no restraining device for the child is used.

When § 121.311 and § 91.107 (previously § 91.14) were first promulgated in 1971, the FAA clarified that the separate use provision for safety belts under part 121 was not intended to apply to part 91 operations. Rather, part 91 "requires only that each person on board occupy a seat or berth with a safety belt properly secured about him." 36 Federal Register 12511 (July 1, 1971). The FAA has previously interpreted this provision as not requiring separate use of safety belts. See Legal Interpretation 1990-14. At the time, this allowance was permissible because seat belts were generally rated in terms of strength and some were rated for more than one occupant to accommodate side-by-side seating arrangements (i.e., bench seats) in certain aircraft that are commonly used in operations conducted under part 91. Thus, under the previous interpretations, the use of a seat belt and seat by more than one occupant may have been appropriate only if: (1) The belt was approved and rated for such use; (2) the structural strength requirements for the seat were not exceeded; and (3) the seat usage conformed with the limitations contained in the approved portion of the Airplane Flight Manual (14 CFR 23.1581(j)). See 36 FR 12511; see also 14 CFR 23.562, 23.785; Legal Interpretation 1990-14; Legal Interpretation to Mr. C.J. Leonard from Hays Hettinger, Associate Counsel (July 26, 1966).

In its comment, the NTSB stated that the shared use of a single seat belt by multiple occupants is never appropriate because this type of use drastically reduces the safety of the occupants. The NTSB asked the FAA to interpret § 91.107(a)(3) in a way that discourages the "unsafe practice of allowing multiple occupants to share a single seat and/or restraint system that [is] not certified for more than one occupant."

Because this is a clarification of prior interpretations and not a rulemaking, the FAA is limited in what it can do in this matter. An interpretation of a regulation cannot ignore the "indications of the agency's intent at the time of the regulation's promulgation." *Air Transport Ass'n of America, Inc. v. F.A.A.*, 291 F.3d 49, 53 (DC Cir. 2002). As discussed above, when the FAA first promulgated the section that ultimately became § 91.107(a)(3), the agency stated that, in contrast to part 121, part 91 did not require that each person have a separate seat and/or seat belt. See 36 FR 12511. Because the FAA cannot rewrite § 91.107(a)(3) through interpretation, the FAA is bound in this matter by the agency's stated intent at the time of this section's promulgation—that a separate

seat and/or seat belt for each person is not required in all circumstances for part 91 operations.

In addition, the FAA notes that changing § 91.107(a)(3) may have far-reaching consequences that would best be addressed through a rulemaking. For example, in its comment, the NTSB acknowledged that some older airplanes currently have bench-style seating that can accommodate multiple passengers with one restraint system. The FAA notes that airplanes with these bench-style seats make up a significant portion of the part 91 community. In addition, aircraft with these types of seating have a significant diversity in their specific seating restraint arrangements—some aircraft with bench seats have a seat belt equipped for each individual passenger while other aircraft with bench seats have a single shared seat belt for use by everyone in the bench seat. Because a significant portion of the part 91 community currently uses some manner of a shared seat/seat belt, the FAA would need to consider, as part of a rulemaking, the effects that changing § 91.107(a)(3) would have on those members of the part 91 community.

Nevertheless, even though § 91.107(a)(3), as previously interpreted by the agency, may allow for shared use of a single restraint in certain situations, the FAA agrees with NTSB that having each passenger use a separate seat and a separate seat belt can be significantly safer than having passengers share a seat and/or seat belt. Accordingly, the FAA strongly encourages PICs in part 91 operations to ensure, whenever possible, that each passenger is seated in a separate seat and restrained by a separate restraint system. With regard to children, the FAA also strongly encourages children to be restrained in a separate seat by an appropriate child restraint system during takeoff, landing, and turbulence.

In its comments, the NTSB also expressed a concern that this clarification could be interpreted to permit multiple occupants to share a single shoulder harness. In response to NTSB's concern, the FAA emphasizes that the proposed clarification was drafted to address the shared use of seats and/or seat belts—not shoulder harnesses. Because the proposed clarification did not address shoulder harnesses, this clarification is limited solely to the shared use of seats and/or seat belts in part 91 operations.

In their comments, the NTSB and an individual commenter also asserted that the structural strength requirements for a seat and the approval and rating for a seat belt are not always available to a general aviation pilot because this

information is typically not included in the AFM. The individual commenter added that many older aircraft do not have an AFM, but instead have an owner's manual that contains even less information.

In response to these comments, the FAA notes that, even though the pertinent information is sometimes not contained in the AFM, information about seat usage limitations and seat belt approval and rating can, in many cases, be obtained from the equipment manufacturer. However, the FAA agrees with the commenters that this information cannot always be obtained from the equipment manufacturer. Accordingly, before multiple occupants are permitted to use the same seat and/or seat belt, if the pertinent information is available, the PIC should check whether: (1) The seat belt is approved and rated for such use; and (2) the structural strength requirements for the seat are not exceeded.

In addition, before seating multiple occupants in the same seat and/or seat belt, PICs should always check to ensure that the seat usage conforms to the limitations contained in the approved portion of the AFM or the owner's manual. Owner's manuals for older aircraft typically show the permissible seating arrangements that are to be used for the aircraft, and the number of people using a seat and/or seat belt should not exceed the number of people shown in the owner's manual seating arrangement.

Issued in Washington, DC, on May 18, 2012.

Rebecca B. MacPherson,

Assistant Chief Counsel for Regulations, AGC-200.

[FR Doc. 2012-12554 Filed 5-23-12; 8:45 a.m.]

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CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Part 1450

Virginia Graeme Baker Pool and Spa Safety Act; Interpretation of Unblockable Drain

AGENCY: Consumer Product Safety Commission.

ACTION: Final rule; revocation; extension of compliance date.

SUMMARY: On October 11, 2011, the Consumer Product Safety Commission ("Commission" or "CPSC") announced that it was revoking its interpretation of the term "unblockable drain," as used in the Virginia Graeme Baker Pool and Spa Safety Act, 15 U.S.C. 8001 et seq.

("VGBA"). The Commission set a compliance date of May 28, 2012, for those who installed VGBA-compliant drain covers on or before October 11, 2011, in reliance on the Commission's initial interpretation. The Commission sought written comments regarding the ability of those who had installed VGBA-compliant unblockable drain covers on or before October 11, 2011, in reliance on the Commission's initial interpretation, to come into compliance with the revocation by May 28, 2012. The Commission is extending the compliance date to May 23, 2013, for those who have installed VGBA-compliant unblockable drain covers on or before October 11, 2011, in reliance on the Commission's original interpretive rule.¹

DATES: This document does not alter the current requirement that public pools and spas be in compliance with the VGBA, which became effective on December 19, 2008. The compliance date for those who installed VGBA-compliant unblockable drain covers on or before October 11, 2011, in reliance on the Commission's April 27, 2010 interpretation of unblockable drains is extended to May 23, 2013.

FOR FURTHER INFORMATION CONTACT:

Perry Sharpless, Directorate for Laboratory Sciences, Consumer Product Safety Commission, 5 Research Place, Rockville, MD 20850; [REDACTED]

SUPPLEMENTARY INFORMATION:

A. Background

In September 2011, the U.S. Consumer Product Safety Commission voted to publish in the **Federal Register** a final rule regarding the revocation of the prior definition of "unblockable drain." (76 FR 62605). The **Federal Register** notice invited comments regarding the ability of those who had installed VGBA-compliant unblockable drain covers, as described at 16 CFR 1450.2(b), to come into compliance with the revocation by May 28, 2012.

B. Comments

The majority of comments the Commission received were unrelated to the ability of the respondents to comply with the May 28, 2012 effective date. The comments that did address the May 28, 2012 compliance date fell into four basic categories. These comments were addressed in the staff's briefing memorandum, "Summary of public

¹ Commissioners Adler, Nord, and Northup voted to extend the compliance date to May 23, 2013. Chairman Tenenbaum voted against extending the compliance date to May 23, 2013.