

**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
2500 Himalaya Road
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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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

1. Propeller - Beech controllable, R002 or R003 with blades as follows:
(See NOTE 6 of Propeller Spec. P-804 for interchangeable blades) 26 lb. (-35)
 - (a) With Continental A-65 engine: R002-205-72
 - (b) 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:
Ercoupe 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)
2. Propeller - fixed pitch metal, McCauley 1A90CF or 1B90CM 26 lb. (-32)
 - (a) 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.
 - (b) 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.
3. 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.

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| 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

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|-----------|---|---------|-------|
| <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)
<u>7/</u> 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-1.	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).

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