

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

4A12
Revision 12
FLETCHER
FU-24
FU-24A

January 22, 1979

AIRCRAFT SPECIFICATION NO. 4A12

Type Certificate Holder Frontier-Aerospace Incorporated
2751 Temple Avenue
Long Beach, California 90806

I. Model FU-24, 1 PCLM (Normal Category), Approved July 22, 1955

Engine	Continental O-470-E (See Items 112, 113, and 114 for optional engines)		
Fuel	80/87 minimum grade aviation gasoline. O-470-E only (See Items 112, 113, and 114 for other engines)		
Engine limits	For all operations, 2600 r.p.m. (225 h.p.)		
Airspeed limits	Maneuvering	Vp	111 mph (96 knots) CAS
	Maximum structural cruising	Vno	131 mph (114 knots) CAS
	Never exceed	Vne	165 mph (143 knots) CAS
	Flaps extended	Vf	80 mph (70 knots) CAS
C.G. range	(+118.7) to (+125.6) at 3500 lbs. (+110.0) to (+125.6) at 2800 lbs. or less (Straight line variation between points given)		
Empty weight C.G. range	None		
Datum	100.2 in. ahead of wing leading edge		
Leveling means	Fuselage upper longerons and bulkhead in cargo area		
Maximum weight	3500 lbs. (See Note 3 for increased weight).		
No. seats	1 (+98). See Item 405 for additional seats.		
Maximum cargo	1300 lbs. (+121) to (+164). Maximum airplane weight including cargo shall not exceed 3500 lbs.)		
Fuel capacity	Two wing tanks, 23.5 gals. each (+110). Total usable 44 gals (+110)		
Oil capacity	3 gals. (+37)		
Control surface movements	Elevator (chord line measured with airplane level) Nose down 20° Nose up 50° Elevator tab (measured with respect to elevator) Trailing edge down 3.5° (elevator 5° nose up) Trailing edge up 9.0° (elevator 20° nose down) Rudder Right 30° Left 30° Aileron Down 10° Up 25° Flaps Down 40°		

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Required equipment	In addition to the pertinent required basic equipment specified in CAR 3, the following items of equipment must be installed: (1, Basic O-470-E engine, 103a, 105ab); or (2, 112, 103b, 105ab, 620); or (3, 112, 103b, 105ab, 620); or 4, 113, 105ab, 621); or (5, 114, 105c, 621, 623); and 201, 202, 403, 404, 611, 612, 613, 614, 615, 618(a) or (b).
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II. Model FU-24A, 2 PCLM (Normal Category), Approved February 28, 1961

Engine	Continental O-470-E (See Items 112 and 113 for optional engines)												
Fuel	80/87 minimum grade aviation gasoline. O-470-E only (See Items 112, 113 for other engines).												
Engine limits	For all operations, 2600 r.p.m. (225 h.p.)												
Airspeed limits	<table><tr><td>Maneuvering</td><td>Vp</td><td>111 mph (96 knots) CAS</td></tr><tr><td>Maximum structural cruising</td><td>Vno</td><td>131 mph (114 knots) CAS</td></tr><tr><td>Never exceed</td><td>Vne</td><td>165 mph (143 knots) CAS</td></tr><tr><td>Flaps extended</td><td>Vf</td><td>80 mph (70 knots) CAS</td></tr></table>	Maneuvering	Vp	111 mph (96 knots) CAS	Maximum structural cruising	Vno	131 mph (114 knots) CAS	Never exceed	Vne	165 mph (143 knots) CAS	Flaps extended	Vf	80 mph (70 knots) CAS
Maneuvering	Vp	111 mph (96 knots) CAS											
Maximum structural cruising	Vno	131 mph (114 knots) CAS											
Never exceed	Vne	165 mph (143 knots) CAS											
Flaps extended	Vf	80 mph (70 knots) CAS											
C.G. range	(+118.7) to (+125.6) at 3500 lbs. (+110.0) to (+125.6) at 2800 lbs. or less (Straight line variation between points given)												
Empty weight C.G. range	None												
Datum	100.2 in. ahead of wing leading edge												
Leveling means	Fuselage upper longerons and bulkhead in cargo area												
Maximum weight	3500 lbs.												
No. seats	2 (+98). See Item 405 for additional seats.												
Maximum cargo	1300 lbs. (+121) to (+164). (Maximum airplane weight including cargo shall not exceed 3500 lbs.)												
Fuel capacity	Two wing tanks, 23.5 gals. each (+110). Total usable 44 gals (+110)												
Oil capacity	3 gals. (+37)												
Control surface movements	Elevator (chord line measured with airplane level) Nose down 20° Nose up 5° Elevator tab (measured with respect to elevator) Trailing edge down 3.5° (elevator 5° nose up) Trailing edge up 9.0° (elevator 20° nose down) Rudder Right 30° Left 30° Aileron Down 10° Up 25° Flaps Down 40°												
Required equipment	In addition to the pertinent required basic equipment specified in CAR 3, the following items of equipment must be installed: (1, Basic O-470-E engine, 103a, 105ab); or (2, 112, 103b, 105ab, 620); or (3, 112, 103b, 105ab, 620); or 4, 113, 105ab, 621); and 201, 202, 406, 407, 611, 612, 613, 614, 615, 618(a) or (b).												

Specifications Pertinent to All Models

Serial numbers eligible	7,102 and up (For aircraft manufactured in the United States prior to transfer to Type Certificate 4A12 to Air Parts, Ltd., of New Zealand). For aircraft manufactured by Air Parts, Ltd., the New Zealand Civil Aviation Division Certificate of Airworthiness for Export, endorsed as noted under "Import Requirements" must be submitted for each individual aircraft for which application for certification is made.
Certification basis	CAR 3 as amended to 16 May 1953 original Type Certificate 4A12 issued 22 July 1955. Date of application for type certificate: 13 November 1953 Type Certificate 4A12 reissued 7 November 1972, to Air Parts, Ltd., of New Zealand, transferred on September 20, 1978, to New Zealand Aerospace Ind., Ltd., and reissued January 22, 1979, to Frontier -Aerospace Inc. of Long Beach, California.
Import requirements	For aircraft manufactured in New Zealand, a United States Airworthiness Certificate may be issued on the basis of a New Zealand Certificate of Airworthiness for Export signed by a representative of the New Zealand Civil Aviation Division containing the following statement: "The aircraft covered by this certificate has been examined and found to comply with CAR 3 as revised 16 May 1953 and conforms to Type Certificate 4A12 and is in a condition for safe operation."
Equipment:	A Plus (+) or minus (-) sign preceding the weight of an item of equipment indicates net weight change when that item is installed.

Propellers and Propeller Accessories (Except De-icing Equipment)

1. (a) Propeller - Hartzell, constant speed, Hub Model HC-82XF-1B, Blades Model 8833 (+11) 65 lbs. (+11)
(Eligible only on Continental O-470-E engine)
Diameter: Maximum 88 in., minimum allowable for repairs 86 in.
No further reduction permitted.
Pitch setting at 30 in. Sta.: Low 10.5°, high 27.0°
(b) Propeller governor, Woodward No. 210065H 4 lbs. (+18)
2. Propeller - Hartzell, Hub Model HC-92ZF-1B1, Blades Model 8847, including governor installed per FAC Dwg. 244383. (Eligible only on Continental O-470-M or O-470-N engine) Use actual weight change
Diameter: Maximum 88 n., minimum 88 in.
Pitch setting at 30 in. Sta.: Low 12.0°, high 24.4°
3. Propeller - McCauley Model 2A36C18/90M-4, including governor installed per FAC Dwg. 244384. (Eligible only on Continental O-470-M or O-470-N engine) Use actual weight change (+11)
Diameter: Maximum 86 in., minimum 84 in.
Pitch setting at 36 in. Sta.: Low 10°, high 22.3°
4. Propeller - McCauley Model D2A36C33/90M-2 including governor installed per FAC Dwg. 244394 (eligible only on Continental IO-470-D engine) Use actual weight (+11)
Diameter: Maximum 88 in., minimum 84 in.
Pitch setting at 36 in. Sta.: Low 8.4°, high 22.3°
5. Propeller McCauley Model 2A36C43/100R-10 including governor installed per SFC Dwg. 244393 (Eligible only on Continental GIO-470-A engine) Use actual weight (+9)
Diameter: Maximum 90 in., Minimum 88 in.
Pitch setting at 36 in. Sta.: Low 11.3°, high 25.0°

Engine and Engine Accessories - Fuel and Oil System

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|------|--|--|
| 101. | Starter, Delco-Remy #1109471 | 14 lbs. (+46) |
| 102. | Carburetor air filter, Air Maze No. P-1A | 1 lb. (+51) |
| 103. | (a) Carburetor - air intake system (less filter) (SFC Dwgs. 244300, 244319, 244322 applicable to O-470-E engine only).
(b) Carburetor - air intake system (less filter) (SFC Dwgs. 244300, 248142 applicable to O-470-N and O-470-M engine only). | Use actual weight
Use actual weight |
| 104. | Delete. | |
| 105. | Fuel pump installation - Editor of following Adel electric fuel booster pumps connected in series with one Romec Model RD7430-2 engine-driven fuel pump.
(a) Adel Model 28470-3 per FAC Dwg. 244855
(b) Adel Model 20113 per FAC Dwg. 244820
(c) One Weldon Tool Co. style "J" Part No. 8001-B fuel booster pump connected in series with engine driven pump per SFC drawing 244887 (eligible only with Item 114 engine installation).
(d) One Weldon Tool Co. style "J" Part No. 8001-A fuel booster pump connected in series with engine driven pump per SFC drawing 244891 (eligible only with item 113 engine installation). | 4 lbs. (+110)
Use actual weight |
| 106. | Delete. | |
| 111. | Unusable fuel (see NOTE 1 for definition) | 18 lbs. (+110) |
| 112. | Engine - Continental O-470-M or O-470-N, installed per FAC Dwg. 248142 and FAC E.O. 691, 701, 702, 703, 706, 707, 714, and 715
Item 2 or 3 is required in lieu of Item 1.
Fuel - 91/97 minimum grade aviation gasoline.
Engine limits: For all operations, 2610 r.p.m. (240 h.p.) | Use actual weight change |
| 113. | Engine - Continental IO-470-D installed per FAC Dwgs. 248162, 248161, and 244395, including E.O.'s 836, 837, 852, 853, 855, 857 through 865, 867 and 874.
Item 4 is required in lieu of Items 1, 2 and 3. Item 621 is required.
Fuel: 100 min. grade aviation gasoline.
Engine limits: For all operations, 2625 r.p.m. (260 h.p.) | Use actual weight |
| 114. | Engine - Continental GIO-470-A installed per SFC Dwg. 248165.
Item 5 is required in lieu of Items 1, 2, 3, or 4.
Items 621 and 623 are required. Eligible on FU-24 only.
Fuel: 100 minimum grade aviation gasoline.
Engine limits: All operations 3200 r.p.m. (310 h.p.) | Use actual weight |

Landing Gear and Floats

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|------|---|----------------|
| 201. | Main landing gear: 8.50-6 four-ply rating tires and 8.50-6 wheel assemblies (3500 lb. max. wt.)
(a) Wheel Assembly Goodrich Model G-3-663-M1
(b) Brake Assembly Goodrich Model D-2-565-1 | 52 lbs. (+141) |
| 202. | Nose wheel: 8.50-6 four-ply rating tire and 8.50-6 wheel assembly
(a) Goodrich Model G-3-852 | 21 lbs. (+51) |
| 203. | Main Landing Gear: 8.50-6 six-ply rating tires and 8.50-6 wheel brake assemblies (4000 lb. max. wt.)
(a) Wheel Assembly Goodrich Model G-3-663-M1
(b) Brake Assembly Goodrich Model D-2-565-1 | 52 lbs. (+141) |

Electrical Equipment

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|------|---|-------------------|
| 301. | Generator Delco-Remy No. 1101892, 35 a. | 16 lbs. (+44) |
| 302. | Battery, Reading (Rebat) No. R33, 12 V | 23 lbs. (+58) |
| 303. | Voltage Regulator
(a) Delco-Remy No. 11188922 lbs. (+62) | |
| 304. | Electrical installation per SFC Dwgs. 248160 (eligible only with Item 114 engine installation). | Use actual weight |

Interior Equipment

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|------|--|--------------------------|
| 401. | Combination seat belt and shoulder harness, Air Associates Model 4465437. | 4 lbs. (+110) |
| 402. | Inertia reel. American Seating Company Model No. O-3903NN-103 | 2 lbs. (+110) |
| 403. | Instrument Installation per FAC Dwg. 246107 | Use actual weight |
| 404. | Pilot's seat, AN-7505 modified per FAC Dwg. 243428 | Use actual weight |
| 405. | Passenger seats (four place) and cover installation per FAC Dwgs. 249500, 249506, 249220 E.O. 667, 249501 E.O. 680. Item 410 is required.
Note: C.G. of forward two passengers is at (+131) and aft two passengers is at (+174) | Use actual weight change |
| 406. | Instrument installation per FAC Dwg. 248150 | Use actual weight |
| 407. | Pilot seat (dual) installation per FAC Dwg. 248144 | Use actual weight |
| 409. | Installation - Seat, agricultural airplane per SFC Dwg. 248154 including 243154 doublers and flap controls per 248155 | |
| 410. | Installation - Head rest, passenger per SFC Dwg. 249262. Required with Item 405. | Use actual weight |
| 411. | Installation - Rear window, passenger compartment per SFC Dwg. 243657. | Use actual weight |

Miscellaneous (Not listed above)

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| 601. | Aerial applicator installation per FAC Dwgs. 249233, 249245 and 249247 Note:
Item 611 is not required with this installation. The C.G. of the hopper load is at (+135.7)
The following placards must be installed in clear view on or adjacent to the hopper:
"Hopper Capacity 1250 Pounds"
"Approved for non-toxic material only" | Use actual weight change |
| 611. | Cargo floor installation per FAC Dwg. 249220 | Use actual weight |
| 612. | Two extended wing tips
(a) FAC Dwg. 241403 (required with aileron installation FAC Dwg. 248104)
(b) FAC Dwg. 241406 (required with Item 616)
(c) FAC Dwg. 241403 (required with Item 617) | Use actual weight
Use actual weight
Use actual weight |
| 613. | Two wing leading edge spoilers per FAC Dwg. 241208 | Use actual weight |

614. Cockpit ventilation and sealing Use actual weight
(a) FAC Dwgs. 241183, 241209, 241210, 241211, 243436, 243703, 244216, 244218, 244219, 244220, 244338, 248131, and 248135 (required with Item 112 and O-470-E engine installation)
(b) FAC Dwgs. 241183, 241209, 241210, 241211, 243436, 243703, and 249266 (required with Item 113)
615. Cargo compartment control system guards per FAC Dwg. 248122 Use actual weight
616. Friese type aileron installation per FAC Dwgs. 241100-E.O. 671, 241214, 241215, 241216, 241217, 241218, 241220, 241310-E.O. 666, 241344, 241345, 241350, 241515, 248137, 248138, 248139, 241219 Note: Item 612(b) is required in lieu of Item 612(a)
617. Bulged type aileron installation per FAC Dwg. 248141 Use actual weight
618. Elevator control horn installation
(a) FAC Dwg. 242526, E.O. 690 Use actual weight
(b) FAC Dwg. 248143
619. Extension limit cables, nose gear per SFC Dwg. 249259 Use actual weight
620. Installation - Engine Cowling removable nose per SFC Dwg. 248156 (applicable to O-470-M and O-470-N engine installations only) Use actual weight
621. Installation - Ventilator, cockpit per SFC Dwg. 249266. Required use actual weight with items 113 and 114
623. Installation - Engine Cowling per SFC Dwg. 248166. Required with Item 114.
- NOTE 1. (a) Current weight and balance report including 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 and at all times thereafter.
(b) The fuel tank capacity includes "Unusable" fuel of three gallons, which cannot be used safely in all flight attitudes and which must be included in the empty weight.
(c) The airplane must be loaded so that the C.G. is within the specified limits at all times taking into consideration the effects of fuel and cargo released overboard.
- NOTE 2. The following placards must be displayed in the locations noted:
(a). In front of and in clear view of the pilot:
(1) "This airplane must be operated as a normal category airplane in compliance with the operating limitations stated in the form of placards and instrument markings. All acrobatic maneuvers, including spins, are prohibited."
(2) Caution: "Fuel tank caps must be secure before flight."
(3) "No Smoking."
(4) "Solo from left seat only." (FU-24A only).
- (b). On the side of the cockpit:
"Maximum Weight and C.G. Range" (For 3500 lb. maximum weight)
Maximum Weight 3500 lbs.
C.G. Range (+118.7) to (+125.6) at 3500 lbs.
(+110.0) to (+125.6) at 2800 lbs. and below
(Straight line variation between points given)
Datum 100.2 inches ahead of wing leading edge.
See loading instructions for cargo operations."
"Maximum Weight and C.G. Range" (For 4000 lb. maximum weight - FU-24 only)
Maximum Weight 4000 lbs.
C.G. Range (+120.7) to (+125.6) at 4000 lbs.
(+110.0) to (+125.6) at 2800 lbs. and below
(Straight line variation between points given)
Datum 100.2 ahead of wing leading edge.

See loading instruction for cargo operations."

"Airspeed and Load Factor Limitations

Never exceed speed	165 mph CAS
Max. structural cruising	131 mph CAS
Maneuvering speed	111 mph CAS
Flaps extended speed (3500 lbs)	80 mph CAS
Flaps extended speed (4000 lbs)	90 mph CAS
Maneuvering load factors	0° flaps +3.8: 40° flaps +2.0"

"Significance of Instrument Markings

Red Radial Line	Max. or Min. allowed
Green Arc	Normal operation
Yellow Arc	Cautionary operation
White Arc	Flap down operating range"

"Engine and Propeller Limits, Fuel and Oil (For O-470-E engine)

Engine - Continental O-470-E

For all operations 2600 r.p.m. (225 h.p.) max.

Cylinder Head Temperature 525°F. max.

Propeller - Hartzell HC-82XF-1B with 8833 blades

Diameter limits 88" to 86"

Pitch setting at 30 inch station, Low 10.5°, High 27.0°

Fuel - 80/87 minimum grade aviation gasoline

Two fuel tanks 23.5 gals. capacity each

Total usable fuel 44 gals.

The unusable fuel of three gals. total cannot be used safely in flight

The fuel gauges read zero when only unusable fuel remains in the tanks.

Oil capacity - three gals.

Oil inlet temperature 225°F. max."

"Engine and Propeller Limits, Fuel and Oil (For O-470-M or O-470-N engine)

Engine - Continental O-470-M (or O-470-N)

For all operations 2600 r.p.m. (240 h.p.) max.

Cylinder Head Temperature 500°F. max.

Propeller - McCauley Model 2A36C18/90M-4

Diameter limits 86 in. to 84 in.

Pitch setting at 36 in. Sta.: Low 10°, High 22.3°

Propeller - Hartzell HC-92ZF-1B1 with 8847 blades

Diameter limits 88" max., 88" min.

Pitch setting at 30 in. Sta.: Low 12.0°, High 24.4°

Fuel - 91/97 minimum grade aviation gasoline

Two fuel tanks 23.5 gals. capacity each

Total usable fuel 44 gals.

The unusable fuel of three gals. total cannot be used safely in flight.

The fuel gauges read zero when only unusable fuel remains in the tanks.

Oil capacity - 3 gals.

Oil inlet temperature 225°F. max."

"Engine and Propeller Limits, Fuel and Oil (For IO-470-D engine)

Engine - Continental IO-470-D

For all operations 2625 r.p.m. (260 h.p.) max.

Cylinder Head Temperature 460°F. max.

Propeller - McCauley D2A36C33/90M-2

Diameter limits 88" max. to 84" min.

Pitch setting at 36 in. Sta.: Low 8.4°, High 22.3°

Fuel - 100 minimum grade aviation gasoline

Two fuel tanks 23.5 gals. (19.5 imp.) capacity each

Total usable fuel 44 gals. (36.5 imp.)

The unusable fuel of three gals. (2.5 imp.) total cannot be used safely in flight.

The fuel gauges read zero when only unusable fuel remains in the tanks.

Oil capacity - 3 gals. (2.5 imp.)
Temperature limits 225°F. maximum."

"Engine and Propeller Limits, Fuel and Oil (For GIO-470-A engine)

Engine - Continental GIO-470-A

For all operations 3200 r.p.m. (310 h.p. @ 28.8" MP) maximum

Recommended Cruise 2800 r.p.m. (233 h.p. @ 26" MP) maximum

Cylinder Head Temperature 460°F. maximum

Propeller - McCauley 2A36C43/100R-10

Diameter limits 90" max. to 88" min.

Pitch setting at 36 in. Sta.: Low 11.3°, High 25.0°

Fuel - 100 minimum grade aviation gasoline

Two fuel tanks 23.5 gals. capacity each

Total usable fuel 44 gallons

The unusable fuel of three gallons total cannot be used safely in flight.

The fuel gauges read zero when only unusable fuel remains in the tanks.

Oil capacity - 15 quarts (U.S.) Oil temperature limits 240°F maximum."

(c) In the cargo compartment @ 3500 lb. mx. wt. @ 4000 lb. max. wt.

(1) "Max. compt. load	1300 lbs.	1500 lbs.
Max. load per lin. ft.	375 lbs.	418 lbs.
Max. load per sq. ft.	375 lbs.	386 lbs.

(2) All items carried in this compartment must be properly secured"

(d) In the passenger compartment:

(1) "No smoking"

NOTE 3. The Model FU-24 only is eligible for a maximum weight of 4000 pounds when modified in accordance with Drawing List No. 24.7003A, Revision dated September 27, 1965, and operated in accordance with limitations for the 4000 lb. gross weight specified in NOTE 2 of this specification. Items of Equipment required for the 4000 pound maximum weight aircraft are: Items 5, 102, 105c, 114, 202, 203, 403, 404, 611, 612, 613, 614, 615, 618(a) or (b), 621, 623.

- END -