United States of America

Department of Transportation — Federal Aviation Administration

Supplemental Type Certificate

Number SA910CE

This certificate, issued to Horton STOL-Craft, Inc.
Wellington Municipal Airport
Wellington, Kansas 67152

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations.

Original Product — Type Certificate Number: 3A12

Make: Cessna

Model: 172 and 172Q Landplane
172A through 172P Landplane and Floatplane

Description of Type Design Change:

Installation of wing leading edge cuffs, drooped tips, stall fences and aileron gap seals per drawings and data called out on STOL-Craft Drawing List #1 with an FAA approval date of May 7, 1973, or later.

Limitations and Conditions: 1. Airplane Flight Manua.. Supplement dated May 31, 1985, is required equipment for the Cessna 172Q Airplane when this modification is installed 2. This approval should not be extended to other specific airplanes of this model c which other previously approved modifications ar incorporated, unless it is determined that the interrelationship between this change and any of those other previously approved modifications will introduce no adverse effect upon the airworth ness of that airplane. 3. Delete all references to intentional spins from the util: category placard, and adjacent to it add a new placard which reads "INTENTIONAL SPIN PROHIBITED.".

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: April 4, 1973

Date of issuance: May 29, 1973

Date reissued: May 16, 1977

Date amended: June 25, 1974, February 18, 1982
April 7, 1982, June 3, 1985

By direction of the Administrator

Robert A. Gambrill, Jr.
(Signature)

Robert A. Gambrill, Jr., Manager
Wichita Aircraft Certification Office
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

FAA Form 8110-2 (10-65)

AIR PLAINS

FAA Approved
Supplemental Airplane Flight Manual

DOCUMENT NUMBER 172056

For

Cessna 172 M & N

Serial No. 17265685 to 17271034

Serial No: 17271553 **Reg. #:** N3455E

The information contained in this flight manual is FAA Approved Material, which, Along with the FAA Approved placards and instrument markings, is applicable to the operation of the airplane when modified in accordance with STC 2196CE, which increases the maximum certificated takeoff weight to 2550 LBS and limits the flap travel to 30 degrees. The airplane must previously have been modified in accordance with ATS SA4428SW which installs a 180HP Lycoming O-360 series and a fixed pitch propeller.

FAA Approved
for Margaret Kline
Manager, Wichita Aircraft Certification Office
FAA Central Region
Wichita,KS

Date: 2/3/2012

Original Date: 09/25/86

SECTION 2: LIMITATIONS

AIRSPEED INDICATOR MARKINGS

Air Plains Services PN: 172861 or 172861-2 or existing airspeed indicator, marked as follows:

MARKING	KIAS VALUE OR RANGE
White Arc	40-85
Green Arc	50-127
Yellow Arc	127-158
Red Line	158

AIRSPEED LIMITATIONS

VA Maneuvering Speed:

2550 Pounds	105 KIAS
2150 Pounds	95 KIAS
1750 Pounds	85 KIAS

POWER PLANT LIMITATIONS

Engine Model Number: O-360-A2F, A3A, A4A, A4M and A4N
Maximum Power: 180 BHP rating
Maximum Continuous RPM: 2700 RPM

Static RPM Limits: 2250 to 2450 RPM

WEIGHT LIMITS

Maximum Takeoff Weight,	
Normal	2550 lbs.
Utility	2000 lbs.
Maximum Landing Weight,	
Normal	2550 lbs.
Utility	2000 lbs.

CENTER OF GRAVITY LIMITS –

NORMAL CATEGORY

Center of Gravity Range:
Forward: 35 inches aft of datum at 1950 lbs. or less, with straight line variation to 41.0 inches aft of datum at 2550 lbs.
Aft: 47.3 inches aft of datum at all weights.

UTILITY CATEGORY

Center of Gravity:
Forward: 35 inches aft of datum at 1950lbs. or less, with straight line variation to 35.5 inches aft of datum at 2000lbs.
Aft: 40.5 inches aft of datum at all weights.

FLIGHT LOAD FACTORS

NORMAL CATEGORY

Flight Load Factors (Maximum Takeoff Weight - 2550 lbs.):
Flaps Up ..... +3.8g, -1.52g
Flaps Down ..... +3.0g

PLACARDS

10 . Near airspeed indicator:

MANEUVER SPEED - 105 KIAS

SECTION 5: PERFORMANCE

LANDING DISTANCE - SHORT FIELD

CONDITIONS:
Flaps 30°
NOTES:
If a landing with flaps up is necessary, increase approach speed by 9 KIAS and allow for 35% longer distance.

Weight LBS	Speed At 50 Ft KIAS	Press Alt Ft	0°C		10°C		20°C		30°C		40°C	
			Grnd Roll Ft	Total Ft To Clear 50 Ft Obs	Grnd Roll Ft	Total Ft To Clear 50 Ft Obs	Grnd Roll Ft	Total Ft To Clear 50 Ft Obs	Grnd Roll Ft	Total Ft To Clear 50 Ft Obs	Grnd Roll Ft	Total Ft To Clear 50 Ft Obs
2550	62	S.L	545	1290	565	1320	585	1350	605	1380	625	1415
		1000	565	1320	585	1350	605	1385	625	1420	650	1450
		2000	585	1355	610	1385	630	1420	650	1455	670	1490
		3000	610	1385	630	1425	655	1460	675	1495	695	1530
		4000	630	1425	655	1460	675	1495	700	1535	725	1570
		5000	655	1460	680	1500	705	1535	725	1575	750	1615
		6000	680	1500	705	1540	730	1580	755	1620	780	1660
		7000	705	1545	730	1585	760	1625	785	1665	810	1705
		8000	735	1585	760	1630	790	1670	815	1715	840	1755

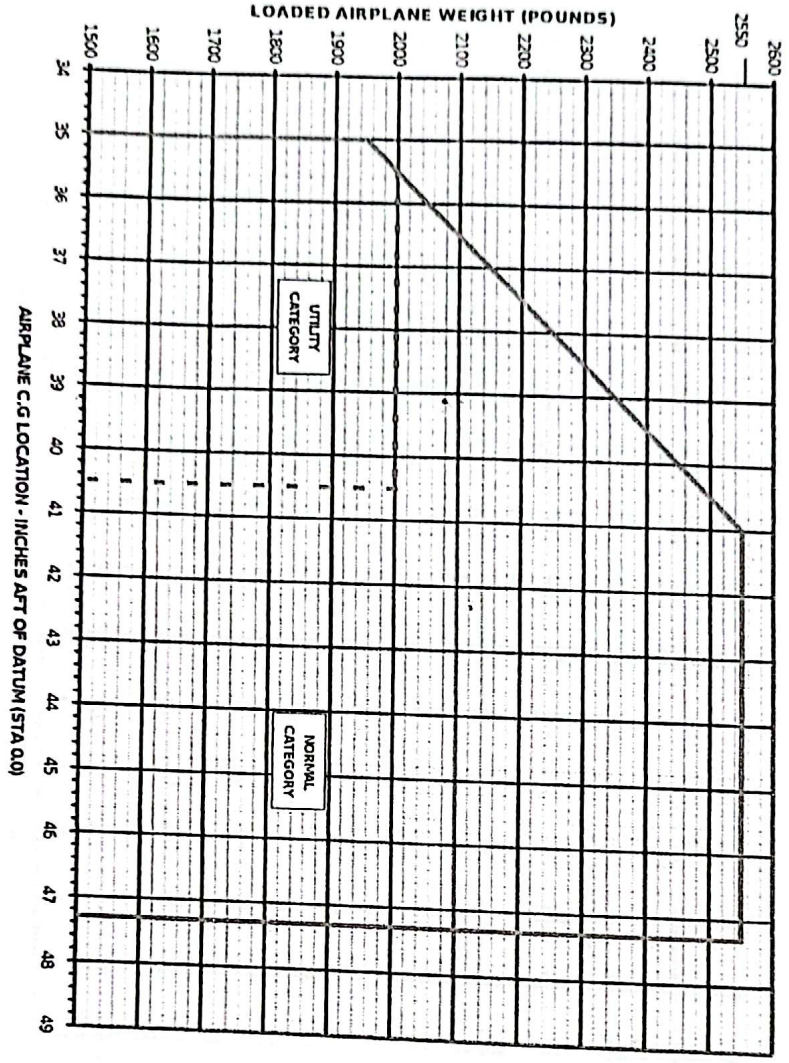
CRUISE FUEL CONSUMPTION

(Not FAA Approved)

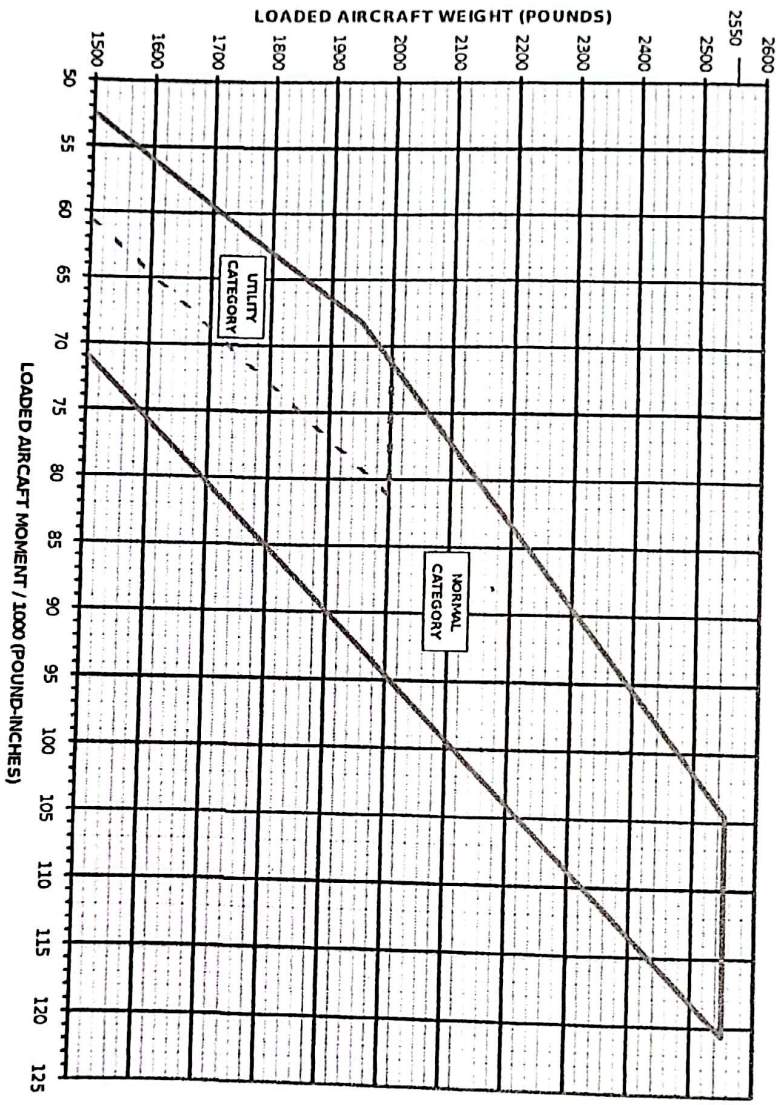
Conditions:
2550 Pounds

Recommended Lean Mixture		20°C Below Standard Temp.		Standard Temperature		20°C Above Standard Temp.	
Press. Alt Feet	RPM	% BHP	GPH	% BHP	GPH	% BHP	GPH
2000	2550	—	—	76	10.2	72	9.6
	2500	77	10.3	72	9.6	68	9.1
	2400	69	9.2	64	8.7	61	8.3
	2300	61	8.3	58	7.9	55	7.6
	2200	55	7.5	52	7.2	49	6.9
	2100	49	6.8	46	6.6	43	6.3
4000	2600	—	—	76	10.2	72	9.6
	2500	73	9.7	68	9.2	65	8.7
	2400	65	8.8	62	8.3	58	8.0
	2300	58	8.0	55	7.6	52	7.3
	2200	52	7.3	49	6.9	47	6.6
	2100	46	6.6	44	6.3	41	6.1
6000	2650	—	—	76	10.1	72	9.6
	2600	77	10.3	72	9.6	68	9.1
	2500	69	9.3	65	8.8	62	8.4
	2400	62	8.4	59	8.0	56	7.6
	2300	56	7.7	53	7.3	50	7.0
	2200	50	7.0	47	6.7	44	6.4
8000	2700	—	—	76	10.1	71	9.5
	2600	73	9.8	69	9.2	65	8.7
	2500	66	8.8	62	8.4	59	8.0
	2400	59	8.1	56	7.7	53	7.3
	2300	53	7.4	50	7.0	47	6.7
	2200	47	6.7	45	6.4	42	6.1
10,000	2700	77	10.2	72	9.6	68	9.1
	2600	69	9.3	65	8.8	62	8.4
	2500	63	8.5	59	8.1	56	7.7
	2400	57	7.8	53	7.4	50	7.0
	2300	51	7.1	48	6.8	45	6.5
12,000	2700	69	9.3	65	8.8	62	8.4
	2600	66	8.9	62	8.4	59	8.0
	2500	60	8.2	56	7.7	53	7.4
	2400	54	7.5	51	7.1	48	6.7
	2300	48	6.8	45	6.5	42	6.2

CENTER OF GRAVITY LIMITS



CENTER OF GRAVITY MOMENT ENVELOPE



FLINT AERO, INC.
1942 Joe Crosson Drive
El Cajon, CA 92020
Doc No.: FTC453.001

FAA APPROVED
AIRPLANE FLIGHT MANUAL SUPPLEMENT
TO THE
OFFICIAL PILOT'S OPERATING HANDBOOK AND
FAA APPROVED AIRPLANE FLIGHT MANUAL
AND
SUPPLEMENTAL AIRPLANE FLIGHT MANUAL
FOR
CESSNA 170, 172, and 175 AIRPLANES
WITH
FLINT AERO AUXILIARY FUEL TANKS

The information in this document is FAA approved material and must be attached to the FAA Approved Airplane Flight Manual or carried in the airplane if the airplane does not have an FAA approved Airplane Flight Manual when the airplane has been modified by the installation of the Flint Aero Auxiliary Fuel Tanks in accordance with STC SA1614WE.

This document is applicable to the Official Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for those Cessna airplanes which require the manual, and to the basic placards and markings for those airplanes without a manual. The following airplanes are included when Flint Aero, Inc. Auxiliary Fuel Tanks have been installed, and this document is applicable to the below model landplanes, ski planes, and floatplanes:

TC A-799:	170A, 170B
TC 3A12:	172, 172A, 172B, 172C, 172D, 172E, 172F, 172G, 172H, 172I, 172K, 172L, 172M, 172N, 172P, 172Q, 172R, 172S
TC A4EU:	* F172F, F172G, F172H, F172K, F172L, F172M, F172N
TC A18EU:	* FR172E, FR172F, FR172G, FR172H, FR172J, FR172K
TC 3A17:	175, 175A, 175B, 175C, R172K, 172RG, R172E

* Reims Aviation S.A. Cessna Models

The information contained herein appends, supplements, or supersedes the Official Pilot's Operating Handbook and FAA Approved Airplane Flight Manual or the basic placards and markings for Cessna 170, 172 and 175 series airplanes only in those areas listed herein. For limitations, procedures, and performance information not contained in this document, consult the Official Pilot's Operating Handbook and FAA Approved Airplane Flight Manual, or the basic placards and markings for the specific Cessna 170, 172 or 175 series airplanes.

FAA Approved Hillu Tong
for Manager, Flight Test Branch, ANM-160L
Federal Aviation Administration
Los Angeles Aircraft Certification Office
Transport Airplane Directorate

FAA Approved Date 5/8/06

SECTION I – GENERAL

This Flint Aero, Inc. Supplement to the Official Pilot's Operating Handbook and FAA Approved Airplane Flight Manual or the basic placards and markings for Cessna 170, 172 175 series airplanes addresses operations when modified by installation of Flint Aero Auxiliary Fuel Tanks in accordance with STC SA1614WE. New performance data are included herein. The changes to the Performance Specifications are shown in Table 1-1 below.

Table 1-1

PERFORMANCE SPECIFICATIONS WITH INTERNAL AUXILIARY TANKS			
SPEED	Maximum (V_{NO})		No Change
	Max Cruise Power – Standard Day Conditions		No Change
CRUISE	With fuel allowance for engine start, taxi, takeoff, climb and 45 minutes reserve.		
	Additional range and endurance for Basic Airplane set in Cruise Power range @10,000 ft with 23 Gal usable auxiliary fuel.	Range	292 NM
		Time	2.3 Hrs.
CLIMB	Sea Level Std Day Rate of Climb		No Change
	Service Ceiling		No Change
TAKEOFF	Sea Level Std Day Ground Roll		No Change
	Total Distance Over 50 Ft. Obstacle		No Change
LANDING	Sea Level Std Day Ground Roll		No Change
	Total Distance Over 50 Ft. Obstacle		No Change
STALL	Flaps Up, Power Off		No Change
	Flaps Down, Power Off		No Change
MAXIMUM WEIGHT	Ramp		No Change
	Takeoff		No Change
	Landing		No Change
STANDARD EMPTY WEIGHT – Basic airplane plus			40 LBS
MAXIMUM USEFUL LOAD – Basic airplane minus			40 LBS
BAGGAGE ALLOWANCE (See applicable POH)			No Change
WING LOADING: lbs./Sq. Ft.			No Change
POWER LOADING lbs./HP			No Change
FUEL CAPACITY Basic airplane plus 23 usable US gal Aux Fuel			23 GAL
OIL CAPACITY			No Change
ENGINE:			No Change
PROPELLER:			No Change

The above performance figures are based on fuel consumption values published in the Official Pilot's Operating Handbook and FAA Approved Airplane Flight Manual or the basic placards and markings for Cessna 170, 172, 175 series airplanes and will vary with individual airplanes and numerous factors affecting flight performance.

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SECTION II – LIMITATIONS

1. Airspeed Limitations
No Change

2. Airspeed Indicator Markings
No Change

3. Power Plant Instrument Markings
The following entry is added to the Powerplant Instrument Markings Table:

Power plant markings and their color-code significance.

INSTRUMENT	RED LINE (MINIMUM)	GREEN ARC (NORMAL OPERATING)	RED LINE (MAX)
Auxiliary Fuel Tank Quantity Indicators	E		
	(0.5 U.S. Gal. Unusable Each Tank)	------	-----

4. Weight Limits

No change. Refer to current weight and balance documents.

5. Center of Gravity Limits

No change

6. Maneuver Limits

No change

7. Flight Load Factor Limits

No change

8. Kinds of Operations Limits

No change

9. Fuel Limitations

Fuel capacity is increased to the values in Tables 1-2 and 1-3 below:

Table 1-2

FUEL CAPACITY, U.S. GALLONS											
CESSNA MODELS	172										
	R,S	Q	N,P	I,K,L,M	C,D,E,F,G,H	B	172, A	P172D	R172K	172RG	R172E
Total Capacity	80	78	66	66	63	66	66	76	76	90	76
Total Usable	76	73	63	61	59	62	60	65	72	85	69
Total Capacity, Each Main Tank	28	27	21	21	19.5	21	21	26	26	33	26
Total Usable, Each Main Tank	26.5	25	20	19	18	19.5	18.5	21.3	24.5	31	23
Total Capacity, Each Aux Tank	12	12	12	12	12	12	12	12	12	12	12
Total Usable, Each Aux Tank	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5

Table 1-3

FUEL CAPACITY, U.S. GALLONS											
CESSNA MODELS	175				F172 (REIMS)			FR172 (REIMS)		170	
	175	175A	175B	175C	F,G,H	K,L,M	N,P	E,F,G ,H,J	K	170A	170B
Total Capacity	76	76	76	76	63	66	67	76	76	42	42
Total Usable	66	65	65	65	59	61	63	69	72	37	37
Total Capacity, Each Main Tank	26	26	26	26	19.5	21	21.5	26	26	21	21
Total Usable, Each Main Tank	21.5	21	21	20.7	18	19	20	23	24.5	18.5	18.5
Total Capacity, Each Aux Tank	12	12	12	12	12	12	12	12	12	12	12
Total Usable, Each Aux Tank	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5

9.1 Auxiliary Fuel Tank Transfer Limits

- When feeding from either or both main tanks, do not transfer auxiliary tank fuel into a main fuel tank until it is at least 15.0 gallons below full.
- When feeding from either main tank, begin tank transfer into that tank before its level drops below five gallons remaining.
- Do not transfer auxiliary fuel unless in level flight.

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- Do not transfer auxiliary fuel during take off, landing, refueling, and when empty.

Note: Main fuel tank quantity below the full level can be determined by reference to fuel quantity gauges and by calculating fuel used by:
1) Estimating engine fuel flow rates versus time.
2) If installed, using engine fuel flow rate indicator vs. time.

10. Placards

The following information is displayed in the form of composite or individual placards.

10.1 In full view of pilot: "Total aux fuel 24 U.S. gals (23 gal useable)." Transfer aux fuel only in level flight when main is half empty and when main tank is not supplying engine. Aux fuel switch must be off during takeoff, landing, filling and when empty. For utility category operation aux tank fuel switch must be off and aux tanks empty."

10.2 At auxiliary fuel tank pump switches:

"Left wing aux fuel
12.0 U.S. gallons
11.5 gallons usable
ON OFF"

"Right wing aux fuel
12.0 U.S. gallons
11.5 gallons usable
ON OFF"

10.3 Installed adjacent to each auxiliary fuel tank leak detection drain (2 per side)

"Fuel or vapor from drain
requires immediate repairs"

10.4 Installed adjacent to appropriate wing tip tank pump circuit breakers or fuses:

"Aux tank L pump" Aux tank R pump"

10.5 For Models 172 through models 172M, F172F through F172M, and Models 170A and 170B; forward of each auxiliary tank filler: "12 U.S. gal. 80/87 min. grade Av. gasoline. Aux. fuel switch must be off before filling."

10.6 For Models 172N (S/N 17261445, 17267585-17259309) and F172N, F172P, FR172E through FR172J, FR172K(1977 model), R172E, R172K (S/N R1722000-1722794); forward of each auxiliary tank filler: "12 U.S. gal. 100/130 min. grade Av. Gasoline. Aux. fuel switch must be off before filling."

10.7 For Models 172N (S/N 17261578,17269310-17274009), 172P, 172Q, 172R, 172S, R172K (S/N R1722725 and on), 172RG, FR172K (1978 model on), forward of each auxiliary tank filler: "12 U.S. gal. 100LL/100 min. grade Av. gasoline. Aux. fuel switch must be off before filling."

SECTION III – EMERGENCY PROCEDURES

NOTE

With Flint Aero, Inc. Auxiliary Fuel Tanks installed, fuel transfer to the standard main wing tanks is provided by the auxiliary fuel transfer tank pumps controlled by the auxiliary fuel tank transfer pump switches.

EMERGENCY LANDING WITH OR WITHOUT ENGINE POWER

Auxiliary Fuel Tank transfer pump switches.....OFF.

WING FIRE

Auxiliary Fuel Tank transfer pump switches.....OFF.

SECTION IV – NORMAL PROCEDURES

PREFLIGHT INSPECTION – AUXILIARY FUEL TRANSFER TANKS

1. Visually inspect external areas of wing around auxiliary fuel tanks for any signs of fuel leakage.
2. Check each auxiliary tank filler cap for security and vent lines for obstructions. Visually check auxiliary fuel tanks for quantity.
3. From each auxiliary fuel tank, drain a sample quantity of fuel. Check for contamination. If any water is visible, drain additional amounts of fuel until all water is expelled from the tank.
4. Master switch on. Check auxiliary fuel tank gauges for fuel quantity.
5. With master switch on, check each auxiliary fuel tank pump for operation by operating each pump separately with auxiliary fuel tank transfer switches. Listen for pump operation. If no noise or vibration, assume pump is not operating. Check for serviceability.

Before Takeoff

a. Add the following to the before takeoff procedure:

Auxiliary fuel tank transfer pump switches.....OFF

SECTION V – PERFORMANCE

This performance data address the operation of an airplane incorporating Flint Aero STC SA1614WE Auxiliary Tanks. There are no changes to the Performance Section except for the Range and Endurance charts.

RANGE AND ENDURANCE PROFILES

With the Flint Aero auxiliary fuel tanks installed, the Cessna 170, 172, 175 series airplanes, cruise performance charts are valid for the usable fuel quantity as stated in the basic manual. The addition of two full 12.0 U.S. Gallons (11.5 gal. usable) Flint Aero auxiliary tanks increases the range and endurance shown in the Cessna Owner's Manuals and Pilot's Operating Handbook and FAA Approved Airplane Flight Manuals. The amount of increase in range and endurance will depend on the cruise speed, altitude, and power setting chosen, and will be different for each powerplant and airplane model. The increase in range and endurance of the added fuel can be calculated from the cruise speed and fuel consumption of each model at the altitude and temperature desired. The new airplane range and endurance can then be found by adding the range and endurance increases to the values tabulated in the Cessna manuals.

To calculate the range increase, find the True Airspeed and Gal/Hr fuel consumption for the cruise altitude and power setting desired. Calculate the cruise Miles per Gallon by dividing the Airspeed by the fuel consumption in gallons per mile:

Miles / Hr ÷ Gal / Hr = Miles / Gal.

Then multiply the miles per gallon by 23 gallons, the usable fuel contained in the auxiliary tanks to obtain the added range. Add this value to the range tabulated in the original Cessna manual to get the new range with the Flint Aero auxiliary tanks installed and filled.

To calculate the endurance increase, divide 23 gallons by the fuel consumption:

23 Gallons ÷ Gallons / Hr = Hrs Endurance. Add this number of hours to the endurance tabulated in the original Cessna manual to get the new endurance with the Flint Aero auxiliary tanks.

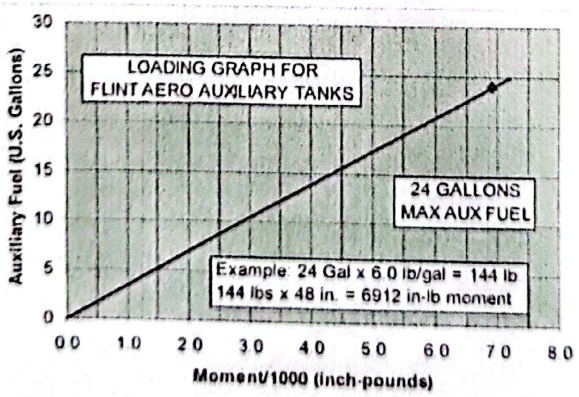
SECTION VI – WEIGHT AND BALANCE/EQUIPMENT LIST

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WEIGHT lbs.	ARM inches	MOMENT lb.-in.
2, 3	J. SPECIAL PACKAGES Install Flint Aero Aux Fuel Tank Systems	FA170	34.0	49.0	1666
	2 - Unusable fuel in Flint Aero Auxiliary Tanks (1.0 U.S. Gal. Avgas at 6.00 lbs./U.S.gal.)	FA170	6.0	50.0	300
	TOTAL INSTALLATION NET CHANGE		40.0	49.2	1966

In calculating weight and balance for full auxiliary fuel tank: 23 U.S. gal.
Avgas usable x 6.0 lbs./U.S. gal. x 48 in. arm = 6624 lb.-in. or 6.624 lb.-in./1000.
C.G. Arm = total moment divided by total weight.

CENTER-OF-GRAVITY

Center of Gravity range, loading moments, and limits are unchanged. The load moment diagram for the auxiliary fuel tanks is shown below:



FAA Approved Date: _____