

FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

TO THE

OFFICIAL PILOT'S OPERATING HANDBOOK AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

FOR

CESSNA T182T and 182T NAV III AIRPLANES

WITH

FLINT AERO STC SA1758WE
INTERNAL WING FUEL TANKS

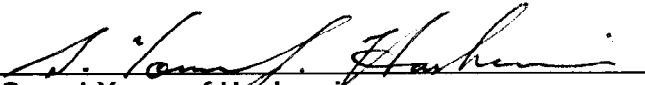
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The information in this document is FAA approved material and must be attached to the FAA Approved Airplane Flight Manual when the airplane has been modified by the installation of the Flint Aero Internal Wing Fuel Tanks in accordance with STC SA1758WE.

This document is applicable to the Official Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for Cessna T182T and 182T Nav III airplanes.

The information contained herein appends, supplements, or supersedes the Official Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for Cessna T182T, 182T Nav III airplanes only in those areas listed herein. For limitations, procedures, and performance information not contained in this Appendix, consult the Official Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for Cessna T182T, 182T Nav III airplanes.

FAA Approved:


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Date: February 13, 2009

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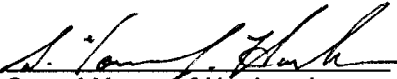
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Wing Fuel Tanks, STC SA1758WE

RECORD OF REVISIONS

This "Record of Revisions" identifies all revisions to this document. When changes to this document are needed, revisions will be issued by the Applicant.

This "Record of Revisions" shall remain in this document at all times. Upon the receipt of revisions, insert the revised page(s) into this document and enter the revision number, revision date, insertion date and signature of person incorporating the revision into the document in the appropriate spaces below.

Revision Number	Revision Date	Pages Affected	Description	FAA Approved
IR	2-12-2009	1-12	Initial Release	 Seyed-Youssef Hashemi, Manager, Flight Test Branch, ANM-160L, FAA Los Angeles Aircraft Certification Office, Transport Airplane Directorate Date: <u>2-13-09</u>

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SECTION I – GENERAL

This Flint Aero, Inc. Supplement to the Official Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for Cessna T182T and 182T airplanes addresses the operation of the airplanes when modified by installation of Flint Aero Internal Wing Fuel Tanks in accordance with STC SA1758WE. 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 WING TANKS			
SPEED	Maximum (VMO)		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 at 75% Power @10,000 ft standard day with 23 Gal usable auxiliary fuel.	Range	230 NM
		Time	1.6 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 useable 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 T182T and 182T Nav III, and will vary with individual airplanes and other factors affecting flight performance.

SECTION II – LIMITATIONS

1. Airspeed Limitations

Never Exceed: 172 KIAS

Reduce V_{ne} 5 KIAS per 1,000 feet above 18,000 feet.

2. 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)	-----	-----

3. Weight Limits

No change

For installation of other modifications by STC, the maximum gross weight is limited to that which is authorized by each particular STC. The pilot must determine this gross weight limit from each appropriate STC.

4. Center of Gravity Limits

Aft CG limit is 44 inches Aft of the Datum with fuel in aux tanks.

5. Maneuver Limits

No change

6. Flight Load Factor Limits

No change

7. Kinds of Operations Limits

No change

8. Fuel Limitations

Fuel capacity is increased to the values in Table 1-2 below:

Table 1-2

Fuel Capacities, Cessna Models T182T, 182T	US Gallons
Basic Airplane Capacity	92
Basic airplane Usable	87
Capacity, Each Main Tank	46
Usable, Each Main Tank	43.5
Capacity, Each Aux Tank	12
Usable, Each Aux Tank	11.5
Total capacity with Aux Tanks	116
Usable, with Aux Tanks	110

9. 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 that main tank is at least 15.0 gallons below full.
- When feeding from either main tank, begin auxiliary tank transfer into that tank before its level drops below five gallons remaining.
- Do not transfer auxiliary fuel unless in level flight.
- Do not transfer auxiliary fuel during take off, landing, refueling, and when auxiliary tank is 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 versus 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."

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10.2 At auxiliary wing fuel tank pump switches:

“ON Left Aux Fuel Tank OFF”

“ON Right Aux Fuel Tank OFF”

10.3 Installed adjacent to each wing aux fuel tank leak detection drain (2 per side):

**“Fuel or vapor from drain
requires immediate repairs.”**

10.4 Installed adjacent to appropriate wing auxiliary tank pump circuit breakers:

“Aux tank L pump” Aux tank R pump”

10.5 Forward of each auxiliary wing tank filler:

**“12 U.S. gal. 100LL/100 min. grade Av. gasoline.
Aux. fuel switch must be off before filling.”**

10.6 On the instrument panel above the standby airspeed indicator:

“NEVER EXCEED SPEED: 172 KIAS”

10.7 On the instrument panel in clear view of the pilot:

“Reduce V_{NE} 5 Kts per 1,000 ft. above 18,000 ft.”

SECTION III – EMERGENCY PROCEDURES

NOTE

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

EMERGENCY LANDING WITH OR WITHOUT ENGINE POWER (add)

Auxiliary Wing Fuel Tank Transfer Pump switches.....OFF.

WING FIRE (add)

Auxiliary Wing Fuel Tank Transfer Pump switches.....OFF.

SECTION IV – NORMAL PROCEDURES

PREFLIGHT INSPECTION – AUXILIARY WING FUEL TRANSFER TANKS

1. Visually inspect external areas of wing around auxiliary wing fuel tanks for any signs of fuel leakage.
2. Check each auxiliary wing tank filler cap for security and vent lines for obstructions. Visually check auxiliary wing fuel tanks for quantity.
3. From each auxiliary wing 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 wing fuel tank gauges for fuel quantity.
5. With master switch on, check each auxiliary wing fuel tank pump for operation by operating each pump separately with auxiliary wing fuel tank transfer switches. Listen for pump operation. If no noise or vibration, assume pump is not operating. Check for serviceability.

Before Takeoff (add)

Auxiliary wing fuel tank transfer pump switches OFF.

SECTION V – PERFORMANCE

The performance data in this appendix address the operation of an airplane incorporating Flint Aero STC SA1758WE Auxiliary Wing 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 wing fuel tanks installed, the Cessna T182T and 182T cruise performance charts are valid for the usable fuel quantity as stated in the basic manual. The use of two full 12.0 U.S. Gallons (11.5 gal. usable) auxiliary wing tanks increases the range and endurance shown in Figures 5-9, 5-10, and 5-11 of the Cessna T182T and 182T Pilot's Operating Handbook Supplement 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. 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:

$\text{Miles / Hr} \div \text{Gal / Hr} = \text{Miles / Gal.}$

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 wing tanks installed and filled.

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

$23 \text{ Gallons} \div \text{Gallons / Hr} = \text{Hrs Endurance.}$ Add this number of hours to the endurance tabulated in the original Cessna manual to get the new endurance with the Flint Aero auxiliary wing tanks.

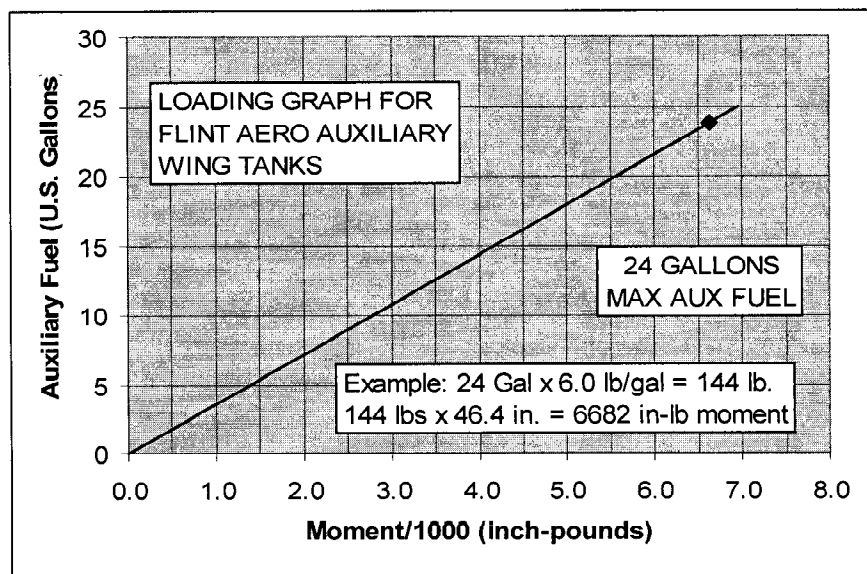
SECTION VI – WEIGHT AND BALANCE / EQUIPMENT LIST

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WEIGHT lbs.	ARM inches	MOMENT lb.-in.
2, 3	J. SPECIAL PACKAGES				
	Install Flint Aero Aux Wing Fuel Tank Systems	FA180	34.0	49.0	1666
	2 - Unusable fuel in Flint Aero Auxiliary Wing Tanks (1.0 U.S. Gal. Avgas at 6.00 lbs./U.S. gal.)	FA180	6.0	50.0	300
	TOTAL INSTALLATION NET CHANGE		40.0	49.2	1966

In calculating weight and balance for full auxiliary wing fuel tank: 23 U.S. gallons Avgas usable x 6.0 lbs./U.S. gal. x 48 in. arm = 6624 in-lb, or 6.624 in-lb/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 wing fuel tanks is shown below:



SECTION VII – AIRPLANE & SYSTEMS DESCRIPTIONS

1. Fuel Tank Capacities (U.S. Gallons)

The Flint Aero Auxiliary Wing Fuel Tanks contain 24 total gallons and 23 usable gallons for all Cessna 182 series airplanes.

2. Operation of Auxiliary Wing Fuel Tanks (transfer)

- To transfer, turn applicable "auxiliary wing fuel tank transfer switch" ON. When auxiliary wing tanks indicate empty, turn applicable transfer switch OFF.
- As a general procedure, do not transfer auxiliary wing tank fuel until after burning approximately 15 U.S. gallons of fuel from each main tank.

NOTE: Should the transfer pump fail, it is not possible to transfer fuel from the affected tank in flight.

3. Electrical

Left and right auxiliary wing fuel transfer tank quantity gauge(s) and pump switches are located on sub panels in left and right wing roots or on the instrument panel or pedestal. The transfer pumps and gauge(s) are powered from the main electrical bus through circuit breakers or in-line fuses.

4. Fuel Quantity Data (U.S. Gallons)

Add 23 U.S. gallons additional usable fuel to the total fuel available in the Cessna tanks. In addition to the Cessna main fuel tanks, two auxiliary wing fuel transfer tanks are installed. The capacity is 12.0 U.S. gallons each tank (11.5 usable U.S. gallons each).

These tanks transfer to their respective main wing tank by transfer pumps controlled by switches in the cockpit.

Each wing tip tank has a water drain and is vented through the fuel filler cap. Fuel gauging is through either individual quantity gauges or a dual gauge.

NOTES

The auxiliary wing fuel (transfer) tank quantity gauge(s) are similar in operation to the main fuel tank gauges and visual inspection of the tanks during preflight is the best assurance of fuel quantities. There are no provisions for visually determining reduced tank quantity.

The fuel in the auxiliary wing fuel transfer tanks is available to the engine only through the main fuel tanks. The main fuel tank gauges are the sole reference gauges for immediately available engine fuel.

Should an auxiliary wing fuel (transfer) tank pump fail, it is not possible to transfer fuel from the affected auxiliary tank during the flight in progress and the pilot must immediately adjust his/her range and endurance calculations on the basis of the fuel available through the standard fuel system.

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SECTION VIII – AIRPLANE HANDLING, SERVICE AND MAINTENANCE WITH AUXILIARY WING FUEL (TRANSFER) TANKS

NOTE

Before flight, check through each auxiliary fuel tank filler necks for auxiliary wing tank fuel quantity. No provision is made for calculating reduced capacity fuel in the auxiliary wing fuel tanks.