

INSTALLATION MANUAL

NUMBER: EFTP- 1

STC SA04550CH

“ELECTRIC FUEL TRANSFER PUMP INSTALLATION”



Alpha Aviation Inc.
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Owatonna, Minnesota 55060
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Revision	Date	Change	Approved
--	02/16/2021	Change issuance	
FOR REVIEW ONLY - NO STC AUTHORIZATION			

EFTP-1 Revision. None, Dated 02/16/2021

STC SA04550CH

“ELECTRIC FUEL TRANSFER PUMP INSTALLATION”

Installation Manual

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Contents:

- A. General References
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A. General References

FAA, AC43.13-1B & 43.13-2B.

Model 415: Ercoupe Service Manual (ESM), Univair

Model 415: Ercoupe Parts Catalog (EPM), Univair

Forney F1/F-1A: Service Manual (FSM), Univair

Forney F1/F-1A: Parts Manual (FPM), Univair

Alon Service Manual (LSM) Univair

~~Mooney M10: Service Manual (MSM), Univair~~

~~Mooney M10: Parts Manual (MPM), Univair~~

Ercoupe Memoranda and Service Bulletin Manual (EBM), Univair

FAA Data Base: Airframe, Engine and Propeller Airworthiness Directives.

B. PARTS LIST INCLUDED WITH PURCHASED STC KIT

C. Installation Description and Documentation

Fuel System

Overview - The fuel system consists of 2 wing tanks that feed a fuselage header tank located aft of the firewall forward of the instrument panel. The header tank gravity feeds the engine

The header tank is continually replenished from the wing tanks via a closed loop system powered by a mechanical fuel pump.

When the fuel in the wing tanks is gone the header tank continues to gravity feed the engine until it is empty.

Fuel quantity indicators are installed to monitor the header and wing tanks.

Airframe Qualification

Aircraft that have a standard airworthiness certificate are eligible for this installation.

The airworthiness certificate must be issued in the Normal category.

Inspect the aircraft and its records to assure that any change in structure or installed equipment does not preclude the installation of this fuel transfer pump system.

Weight and Balance

The weight and balance change which occurs with this upgrade is not quantifiable in advance and must be determined and documented by the installer. Either through the keeping of a log as items are removed and replaced or the weighing of the aircraft a completion.

FAA Documentation

This installation is an FAA approved installation when done in a conforming manner. All parts supplied by Alpha Aviation Inc. are either FAA/PMA modification articles or standard parts. The Installation Manual, EFTP-1 is approved data.

When the installation is completed, per the approved data, the installer should:

Update the aircraft equipment list.

Update the aircraft weight and balance record.

Install the Flight Manual Supplement; EFTP-6 into the Airplane Flight Manual or Operation Limitations.

Install the Instructions for Continued Airworthiness; EFTP-7 into the aircraft maintenance records.

Make the appropriate maintenance entries in the engine and aircraft logbook.

Prepare and submit a Form 337 to the FAA.

D. Install Electric Fuel Transfer Pump and Warning Lamp

1. Install the electric fuel transfer pump (PN AAI-476087) and pressure switch (PN AAI-76577) are shown on drawing EFTP-2.
2. Install the Fuel Transfer Pump 10amp Switch/Breaker and Warning Lamp as detailed on drawing EFTP-3.
3. Complete the electrical interconnections by reference to drawing EFTP-4
4. Install the required Placards and Markings by reference to drawing EFTP-5.

E. Install Fuel Pump Fittings and Reconnect

1. By reference to drawing EFTP-2; mount the fuel transfer pump to the firewall and assemble the AN911-1D Nipple, AN917-1D Tee fitting and AAI -76577 Switch; install the assembly into the fuel transfer pump outlet fitting. (Top ¼" NPT port)
2. Reinstall the fuel pump output fitting removed from the engine driven fuel pump during disassembly into the bottom end of the AN917-1D TEE installed in step 1.

Note - This fitting is extremely important to the system to prevent overflow of fuel from the fuselage fuel header tank. This fitting can be identified by the .0625" restriction in its output; PN: 415-48201-28 / AN844-4DS.
3. Install the fuel pump input fitting removed from the engine driven fuel pump during disassembly. The fitting is an AN844-4D installed in the bottom port of the fuel pump.
4. Reconnect the fuel pump output line by adjusting the length of the fuel line originating at the firewall top bulkhead fitting to the fuel pump upper port – pressure switch location. Adjust the length and position to maintain an acceptable bend radius.
5. Reconnect the fuel pump input line by adjusting the length of the fuel line originating at the firewall lower bulkhead fitting to the fuel pump lower port. Adjust the length and position to maintain an acceptable bend radius.
6. Restore fuel flow to the Transfer Pump System and leak test.

F. Fuel Gauge Requirement

A fuel gauge must be installed in at least one wing tank (the wing tanks are inter-connected) and the fuselage header tank to provide the pilot an accurate fuel level indication.

1. Original Equipment
 - a. The fuselage header tank fuel gauge, Models 415-C, -CD, -D, -E, -G is a simple float activated wire gauge.
 - b. Model 415-C aircraft serial number 113-2622 were equipped with a fuel gauge in the right-hand wing tank. This gauge was inside the cockpit adjacent to the right seat passenger's right leg. This gauge assembly was removed along with the turnplate fuel tanks in accordance with Ercoupe Service Memorandum ESM-39.

Most Model 415-C aircraft serial number 113-2622 have been retro- fitted with newer aluminum wing tanks with a redesigned fuel gauge in left tank. See c. below.
 - c. Models 415-C, -CD, -D, -E, -G serial number 2623 and above are equipped with aluminum wing tanks which feature a fuel gauge assembly (PN:415-48115) installed in the left tank.

Gauge readings are visible through a side wall opening at the pilot's left knee. Replacement assemblies are no longer available.
2. Replacement fuel caps and gauges can be installed - use extreme caution to ensure that any replacement caps and/or gauges maintain the required fuel tank venting.

Univair Aircraft Corporation, Service Bulletin 33, Dated March 5, 2012, covers this subject in detail and should be consulted any time fuel system components are being serviced, repaired or replaced.

G. Markings and Placards

Verify that Item D., 4 above has been completed - See drawing EFTP - 5

H. Final Inspection and Testing

1. Visually inspect the instrument panel installation.
2. Replenish the main fuel tanks and inspect for leaks.
3. Test the fuel transfer pump system operationally for leakage.
4. Operationally test the fuel transfer pump system warning light by closing the emergency main tank fuel feed valve and observe the warning light until it indicates a loss of fuel flow.
5. Open the emergency main fuel valve and run the fuel transfer pump with the warning light extinguished and it has filled the header tank; with the excess fuel being returned to the left main tank properly.

AAI-76577 Hobbs pressure switch adjustment procedure

The Hobbs pressure switch has an adjustment device consisting of either a slotted or allen wrench stud under the rubber

Remove rubber cap and set aside.

Locate adjustment stud.

Loosen the nut if so equipped.

Turn stud "out" (counterclockwise). Switch is normally factory set at 4-psi.

Reduce pressure setting to a point where the warning light will extinguish with pump "on" and pumping and will illuminate when the pump is turned "off" or when the wing tanks are empty.

Simulate empty main tanks by temporarily closing the emergency main fuel tank shutoff valve.

Open the emergency main fuel tank shut off valve.

Secure lock nut if so equipped and reinstall rubber cap.

I. Mechanical fuel pump removal

Remove the fuel pump mounting bolts and pump assembly.
Retain the mounting hardware.

Clean crankcase gasket surface.

Obtain locally and install TCM #533965 cover using TCM #530642 gasket and previously removed hardware.

Fabricate a .032 aluminum filler to close the opening that resulted from the removal of the mechanical fuel pump and rivet in place.

Remove the 2 rubber grommets used to protect the removed fuel lines with .032 aluminum doublers or 1” snap plugs.

Seal any openings with silicone sealer.

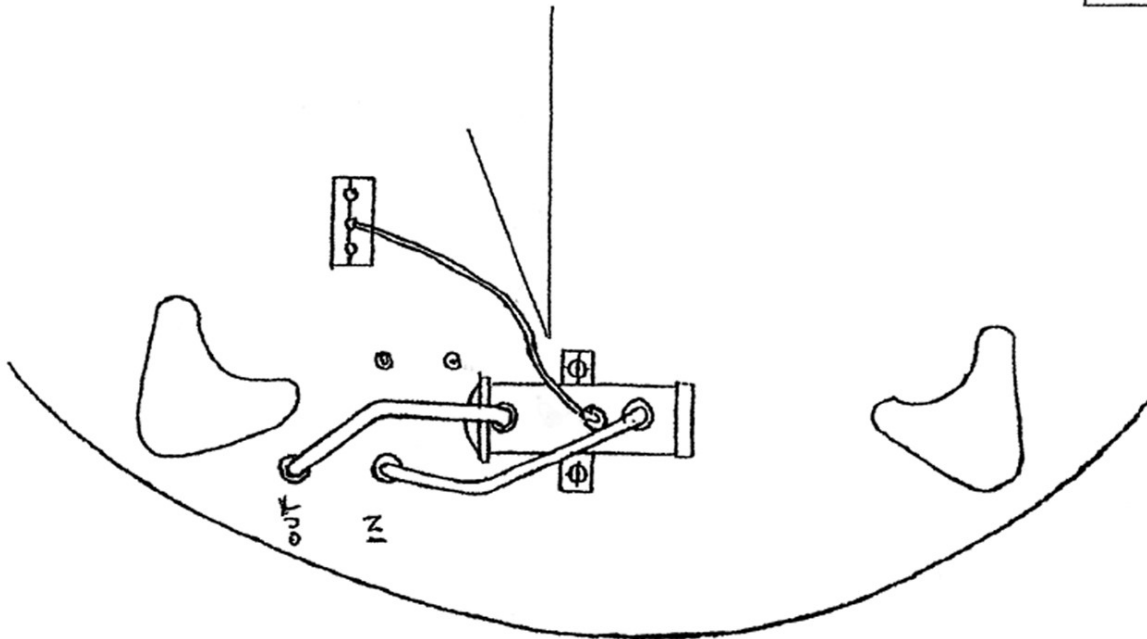
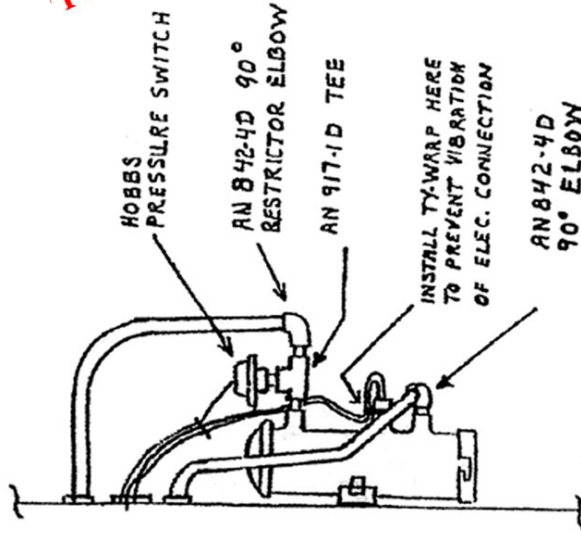
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Airframe Wiring - 1. Install Fuel Pump AAI-476087

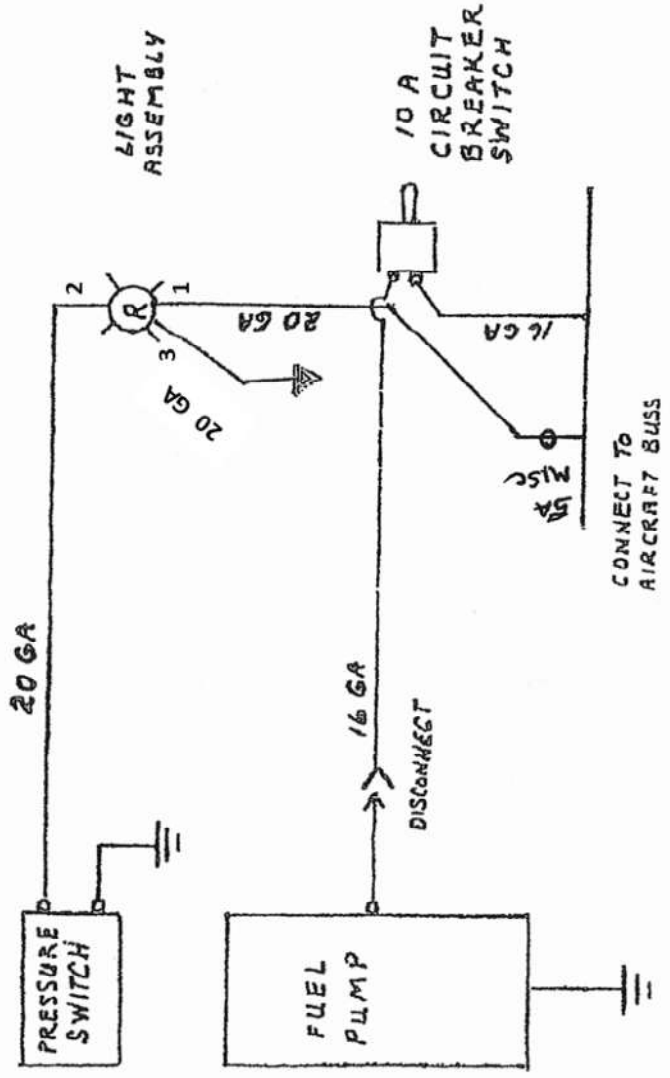
2. Install Fuel Pressure Switch AAI-76577
3. Install Fuel Transfer Warning Light
4. Wire warning light to accessory fuse
5. Install fuel pump switch AAI-W31G10
6. Wire fuel pump circuit
7. Wire warning light circuit at pump

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Drawn	Date	Revision	Name	Drawing Number
DCM	2/16/2021	None	Airframe Installation	EFTP - 2
Approved <i>DCM</i>	Tolerance .xxx	None	Alpha Aviation Inc.	Owatonna, Minnesota

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Drawn DCM	Date 2/16/2021	Revision None	Name Wiring Diagram	Drawing Number EFTP - 4
Approved DCM	Tolerance .xxx	None	Alpha Aviation Inc.	Owatonna, Minnesota

The following information must be provided to the pilot in the form of placards.

- a. On the instrument panel at the fuel transfer pump switch and at the appropriate switch position:

**“ Fuel Transfer Pump
On – Off
Turn On to Keep Nose Tank Full”**

- b. At the fuel transfer pump warning light:

**“ Transfer Pump Warning
Turn Fuel Transfer Pump Off When Light Is On”**

- c. On the instrument panel in full view of the pilot:

“Do Not Turn Generator or Alternator Off In Flight”

- d. At the Generator or Alternator breaker as appropriate:

“Generator” or “Alternator”

- e. At the fuel transfer pump combination Switch / Breaker:

“Fuel Transfer Pump – 10A”

Drawn	DCM	Date	2/16/2021	Revision	None	Name	Placards and Markings	Drawing Number	EFTP - 5
Approved	<i>DCM</i>		Tolerance .xxx		None		Alpha Aviation Inc.		Owatonna, Minnesota

FOR REVIEW ONLY - NO STC AUTHORIZATION

Alpha Aviation Inc.
1500 East Main St.
Owatonna, MN 55060

Airplane Flight Manual Supplement for
Univair – Erco, Forney, Alon, Aircraft Per AML

Supplement No. EFTP – 6 Rev B 09/08/2021

FAA- APPROVED
AIRPLANE FLIGHT MANUAL SUPPLEMENT
FOR
Univair - ERCO, Forney, Alon, Aircraft Per AML

Make _____
Model No. _____
Serial. No. _____
Registration. No. _____

This supplement must be attached to the FAA – approved Operating Limitation document or Airplane Flight Manual when an “Electric Fuel Transfer Pump Installation” is installed in accordance with STC SA04550CH.

The information contained in this document supplements or supersedes the basic manual only in those areas listed. For limitations, procedures, performance and loading information not contained in this supplement, consult the Operating Limitation document or basic Airplane Flight Manual.

FAA-Approved: ROBERT KLASE Digitally signed by ROBERT
2021.12.16 13:46:28 -06'00'

For Monica Merritt Manager, Southwest Flight Test Section AIR-713
Federal Aviation Administration
Ft Worth, Texas

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Log of Revisions

FAA APPROVED
DATE: DEC 16 2021

Alpha Aviation Inc.
1500 East Main St.
Owatonna, MN 55060

Airplane Flight Manual Supplement for
Univair – Erco, Forney, Alon, Aircraft Per AML

Supplement No. EFTP – 6 Rev B 09/08/2021

Revision Number	Description	Pages Revised	FAA-Approved	Date
A	Initial Release		R. Shane Klase	09/08/21
B	Added details	3	ROBERT KLASE Approved by ROBERT Date: 2021.12.16 13:44:18 -06'00'	

FOR REVIEW ONLY - NO STC AUTHORIZATION

FAA APPROVED
DATE: DEC 16 2021

Supplement No. EFTP – 6 Rev B 09/08/2021

GENERAL DESCRIPTION

The installed electric fuel transfer pump installation removes the airframe / engine fuel transfer interface and mounts an electric pump on the firewall of the aircraft and reroutes the existing fuel lines from the engine pump to the firewall mounted electric fuel transfer pump. An electrical circuit equipped with fusing, switching and warning light is added for safety and control.

I. LIMITATION:

a. Airplane Operation Limitations

The following additional placards must be installed:

1. At the fuel transfer, pump switch:

“TURN ON TO KEEP NOSE TANK FULL.”

2. At the fuel transfer warning light:

“TURN FUEL TRANSFER PUMP OFF WHEN LIGHT IS ON.”

Note: See remarks under Procedures Section of this Supplement.

3. On the instrument panel in full view of pilot.

“DO NOT TURN ALTERNATOR / GENERATOR OFF IN FLIGHT

II. PROCEDURES

Cockpit Check List

Starting – add statements

1. Master Switch – ON. Verify fuel transfer warning light is ON.
2. Fuel transfer switch – ON.

Flight – add statement

When wing tank fuel is no longer being transferred to the fuselage tank, the fuel transfer red warning light will come on. The fuel transfer pump must be turned off at this time to prevent over heating of the pump.

III. PERFORMANCE

No change.

IV. LOADING INFORMATION:

No change.

FAA APPROVED
DATE: DEC 16 2021

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STC SA 04550 CH
"Electric Fuel Transfer Pump Installation"

Alpha Aviation Inc.
1500 East Main Street
Owatonna, Minnesota 55060

Instructions for Continued Airworthiness
for

Univair – Erco , Forney, Alon, Mooney Aircraft per AML

Make _____

Model No. _____

Serial. No. _____

Registration. No. _____

FAA-Approved: _____

Date _____

Instruction for Continued Airworthiness

STC SA 04550 CH

“Electric Fuel Transfer Pump Installation”

1. Introduction; This ICA is issued to provide information pertinent to the inspection and ongoing maintenance of the “Electric Fuel Transfer Pump Installation” installed on this aircraft.
2. Description; This aircraft has been modified with the addition of a “Electric Fuel Transfer Pump Installation” and associated changes.
3. Operation; The “Electric Fuel Transfer Pump Installation” is subject to operation in accordance with the applicable Univair – Erco, Forney, Alon, Mooney Operating Limitations or approved Aircraft Flight Manual and the FAA approved Flight Manual Supplement; EFTP - 6.
4. Servicing information; Specific service operations are to be completed in accordance with the individual component manufacturers Service Instructions.
5. Maintenance instructions;
Maintenance and inspection of the installed “Electric Fuel Transfer Pump Installation” is to be accomplished by reference to the component manufacturers Service Manuals, Service Instructions, Bulletins and reference to Installation Manual; EFTP - 1.
6. Trouble shooting procedures; Normal in all respects.
7. Removal and replacement; Per Installation Manual EFTP – 1 and its general reference Listings.
8. Diagrams; None required.
9. Special inspections; None required.
10. Special treatments; None required.
11. Data; Standard procedures and torque values apply.

EFTP - 7 rev. none, Dated 02/16/2021

12. Special tools; None required.
13. Does not apply.
14. Overhaul periods; Overhaul per manufacture's recommendations and current FAR requirements. – no specific time in service requirement.
15. Airworthiness limitations;

Airworthiness Limitations

The Airworthiness Limitations section is FAA approved and specifies maintenance Required under Parts 43.16 and 91.403 of Title 14 Code of Federal Regulations unless an alternate program has been FAA approved.

Mandatory component replacement times – None specified

Structural inspection interval – None specified

Structural inspection procedures – None specified

16. Revisions; All revisions to this document must be prepared and presented to an FAA inspector, for field approval in the form of an FAA Form 337.

End

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INSTALLATION NOTES
For Reference Only: Not FAA Approved Data

STC SA04550CH
Electric Fuel Transfer Pump Installation
As Amended January 18, 2022

1. The revised fuel system weight change is approximately +2.5 lbs.
2. The fuel pressure warning light will require a second ground to enable the push to test feature
3. The engine driven fuel pump fittings are reused, and the outlet fitting must be the AN844-DS (S + special), (415-48201-40) restricted fitting to avoid overflowing the header tank and providing the back pressure required to extinguish the Fuel Pump Warning Light
4. The AAI-76577 Fuel Pressure Switch is adjustable – instructions are included in the Installation Manual