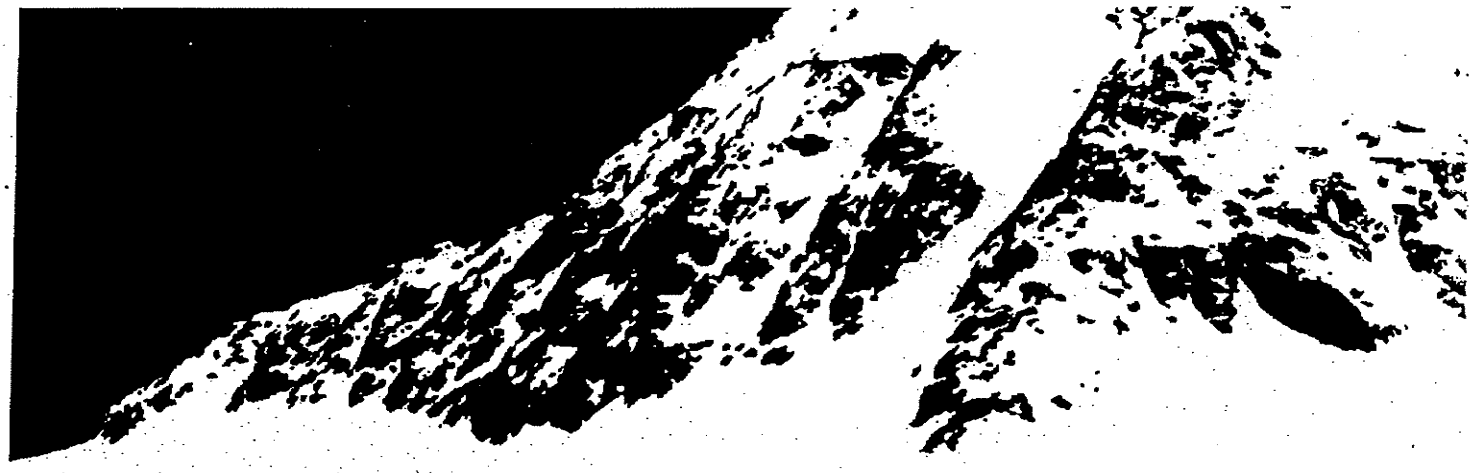

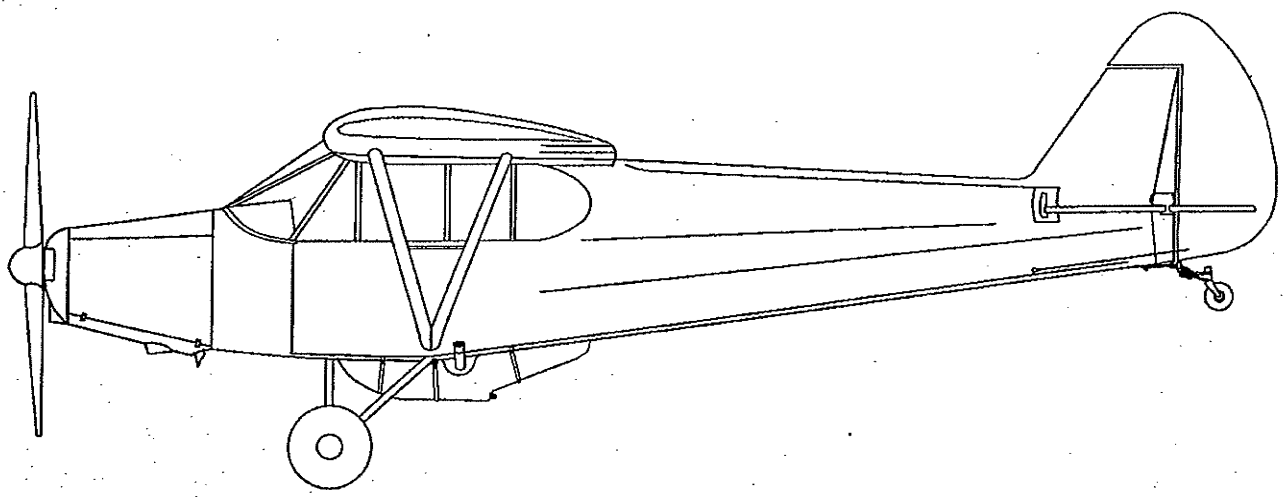

INSTALLATION MANUAL
for
AIRGLAS® LT32PA-18 BELLY TANK

for

Piper PA-18

Nov. 13, 1996

AIRGLAS MANUAL NO. LT32-105

AIRGLAS ENGINEERING CO., INC.
ANCHORAGE, ALASKA 99519

AIRGLAS MODEL LT32PA-18 BELLY TANK

SPECIFICATIONS

The AIRGLAS MODEL LT32PA-18 BELLY TANK was one of the first auxiliary fuel systems approved for the PA-18 airplanes. The installed empty weight of the complete kit is 32 pounds, not including the auxiliary fuel transfer pump, electrical components and tubing. The empty weight acts through an arm of 33.9 inches, measured aft from the wing leading edge. The installed weight of the auxiliary fuel transfer pump, electrical components, and aluminum tubing and fittings not supplied with the kit is 3.1 pounds and acts through an arm of 25.6 inches, measured aft from the wing leading edge.

AIRPLANE INSTALLATION ELIGIBILITY

The AIRGLAS MODEL LT32PA-18 BELLY TANK WITH AUXILIARY ELECTRIC FUEL TRANSFER SYSTEM may be installed on the following Piper airplane models:

- PA-18 "125", PA-18 "135", and PA-18 "150";
- PA-18S "125", PA-18S "135", and PA-18S "150";
- PA-18A, PA-18A "135", and PA-18A "150"; and
- PA-18AS "125", PA-18AS "135", and PA-18AS "150"

The Airglas Model LT32PA-18 Belly Tank With Auxiliary Electric Fuel Transfer System may be installed on any airplane of the above Piper models that:

1. Is equipped with sight gauge type fuel quantity indicators;

2. Is equipped with a 12-volt electrical system;

3. In the case of the PA-18A series models, has cabin floorboards and a rear seat installation modified to PA-18 series configuration in accordance with FAA approved data;

4. In the case of PA-18 "125", PA-18A, PA-18S "125", and PA-18AS "125" models, has a right wing fuel tank and header tank installed in accordance with Item 102 of Type Certificate Data Sheet No. 1A2, Revision 35;

5. In the case of PA-18S "125", PA-18S "135", PA-18AS "125", and PA-18AS "135" models, has Edo 89-2000 floats installed in accordance with Item 209(b) of Type Certificate Data Sheet No. 1A2, Revision 35;

6. In the case of landplane models, is equipped with a wheel/tire or ski installation which positions the main landing gear axle centerlines at least 9 3/8 inches above the ground or bottoms of the skis; and

7. Does not incorporate any other modifications that are incompatible with the belly tank installation.

AIRGLAS MODEL LT32PA-18 BELLY TANK

REQUIRED EQUIPMENT

No special tools or equipment are needed to install the AIRGLAS MODEL LT32PA-18 BELLY TANK. Only standard shop tools for working with aircraft sheet metal, fabric, fuel line tubing and fittings, and electrical wiring and fittings are required.

Belly Tank Installation

STEPS	INSTRUCTIONS
1	Remove the landing gear step assembly if it is present, in accordance with Drawing No. LT32.
2	Install four (4) P/N 4130-1 clamps in accordance with Drawing No. LT32.
3	Install the P/N 4130-3-2 strap assembly in accordance with Drawing No. LT32.
4	Install the P/N 4130-5-3 strap assembly in accordance with Drawing No. LT32.
5	Install the P/N 4130-7-4 strap assembly in accordance with Drawing No. LT32.
6	Remove the rear seat cushions. Measure 10.5" forward from the front edge of the lower aft cross tube of the rear seat (Piper P/N 12178-3) and 4.0" inboard from the left (inboard edge) bottom longeron assembly (Piper P/N 10572). This establishes the location where the auxiliary belly tank fuel transfer line fitting penetrates the bottom of the fuselage. Mark the fuselage bottom fabric (or metal belly panel, if your airplane has metal belly panels installed) at this point.

AIRGLAS MODEL LT32PA-18 BELLY TANK

Belly Tank Installation

STEPS	INSTRUCTIONS
7	If your airplane has a fabric-covered fuselage bottom, cut a 1/4" hole in the fuselage bottom fabric with a sharp knife at the point marked in Step 6. Install an inspection plate ring whose inner diameter is sufficient to clear the fuel transfer line fitting, on the fabric concentric with the 1/4" hole, and allow to dry. If your airplane has metal belly panels, drill a 1/4" hole in the belly at the point marked in Step 6.
8	Lift the belly tank into place and attach the P/N 4130-34-3, P/N 4130-29-4, P/N 4130-30-2 strap assemblies loosely, using the attaching hardware specified in Drawing No. LT32.
9	Adjust the belly tank to obtain a proper fit against the bottom of the fuselage and to center the auxiliary fuel transfer line fitting at the center of the hole in the bottom fabric or metal belly panel. Enlarge the hole in the fuselage bottom fabric or metal belly panel to accept the auxiliary belly tank fuel transfer line fitting. If your airplane has metal belly panels, you may find it necessary to remove the belly tank from the airplane in order to enlarge the hole. In that case repeat Step 8 and the centering adjustment of this step after the hole has been enlarged.
10	Tighten the strap attaching hardware to the torque values specified on Drawing No. LT32.

Fuel Transfer Pump, Check Valve, and Tubing Installation

STEPS	INSTRUCTIONS
1	Turn the airplane's fuel selector valve to the OFF position. Drain all fuel from the left wing tank (Piper P/N 10849-32), making certain that the airplane and the container into which the fuel is drained are grounded during the entire defueling operation. Disconnect all fuel and vent hoses from their fittings on the left wing tank. Remove the fuel quantity indicating sight gauge from the left wing tank. Remove the left wing tank from the airplane. Purge the tank of all inflammable vapors in accordance with AC 43.13-1A, Chapter 14, Section 2, Paragraph 710.

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Fuel Transfer Pump, Check Valve, and Tubing Installation

2	Have a qualified person weld the P/N LTC18-7 wing tank fitting into the left wing tank in accordance with Drawing No. LTC18-4.
3	Re-install the left wing tank in the airplane. Re-install the sight gauge and reconnect the fuel and vent hoses to their fittings on the tank.
4	Manufacture the P/N LTC18-15 auxiliary fuel transfer pump mounting plate in accordance with Drawing No. LTC18-15.
5	Attach the auxiliary fuel transfer pump (Maule Aircraft Corporation P/N 480545) to the pump mounting plate in accordance with Drawing No. LT32-6. Again refer to Drawing No. LT32-6 and note the orientation the pump will have when it is installed in the airplane.
6	Using Drawing No. LT32-6 as **a schematic reference only**, orient the pump as it will appear when installed in the airplane. Install an AN822-6-2D elbow in the IN port of the auxiliary fuel transfer pump, with the open end of the elbow directed so it will face downward when the pump is installed. Install another AN822-6-2D elbow in the OUT port of the auxiliary fuel transfer pump, with the open end of the elbow directed so it will face the left side of the fuselage when the pump is installed (the elbow is shown as if facing up on Drawing No. LT32-6 for schematic purposes).
7	Loosely attach the auxiliary fuel transfer pump mounting plate to the forward cross tube of the rear seat (Piper P/N 12178-2), using two AN742-16 (or equivalent) plain clamps as shown on Drawing No. LT32-6. Note that, when the clamps and the plate are installed correctly, the plate will be on the aft side of the seat cross tube and the pump will be on the aft side of the plate. Adjust the lateral position of the pump mounting plate so that it can be attached to the aft side of the Piper P/N l0569 fuselage bottom frame diagonal tube assembly using a single MS21919F16 cushioned clamp as shown on Drawing No. LT32-6. When the clamps and the pump mounting plate are properly positioned so that the plate is vertical and just on the aft sides of the tubes, torque the clamp attaching bolts to 20 inch-pounds minimum, 25 inch-pounds maximum.
8	Using Drawing No. LT32-6 as a **schematic reference only**, install an appropriate length of 3/8" outer diameter aluminum fuel line tubing to connect the auxiliary belly tank fuel transfer line fitting to the elbow on the inlet (IN port) of the auxiliary fuel transfer pump.

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Fuel Transfer Pump, Check Valve, and Tubing Installation

9	Remove a sufficient number of the interior panels from the left side of the airplane's cabin to allow routing of the auxiliary fuel transfer tubing. Install an AN822-6-6D elbow in the P/N LTC18-7 fitting in the left wing tank, with the open end of the elbow facing aft.
10	Using Drawing No. LT32-6 as a **schematic reference only,** route an appropriate length of 3/8" outer diameter aluminum fuel line tubing from the elbow on the outlet (OUT port) of the auxiliary fuel transfer pump to the inlet of the check valve, and another appropriate length of 3/8" outer diameter aluminum fuel line tubing from the outlet of the check valve to the left side of the fuselage, up the left side of the fuselage, across the frame of the left side window, and forward to connect to the elbow on the P/N LTC18-7 fitting in the left wing tank. **CAUTION: Be certain that the arrow on the check valve body is pointing AWAY from the auxiliary fuel transfer pump and TOWARD the left side of the fuselage.** The installation of the auxiliary fuel transfer line must be accomplished in accordance with AC 43.13-1A, Chapter 14, Section 2, Paragraph 709, except that the length of tubing that crosses the frame of the left side window must span a distance greater than 16 inches between supporting clamps.

Electrical Equipment Installation

STEPS	INSTRUCTIONS
1	The wiring harness must be fabricated and supplied by the installer. Sharp bends in the wires must be avoided and wiring harness must not be routed close to control cables. The wiring harness **MUST NOT** be secured to fuel lines under any circumstances. The installation of electrical equipment and wiring required for the auxiliary fuel transfer pump must be accomplished in accordance with Drawing No. LTC18-7, LTC18-8, LTC18-9, and LTC18-11. Details of the installation not specified on those drawings must be accomplished in accordance with AC 43.13-1A, Chapter 11, Sections 2, 3, 4, 5, and 7.

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Electrical Equipment Installation

2	Install the circuit breaker in accordance with Drawing No. LTC18-9. Label the circuit breaker using lettering that will provide high contrast at all light levels.
3	Install the auxiliary fuel transfer pump switch and annunciator light in accordance with Drawing No. LTC18-8. Label the switch and annunciator light using lettering that will provide high contrast at all light levels.
4	Fabricate and install the interconnecting wiring harness in accordance with Drawing No. LTC18-7. Route the wires to follow existing wire bundles in the airplane, in accordance with Drawing No. LTC18-11.

List of Major Electrical Parts

PART DESCRIPTION	PART NUMBER	MANUFACTURER
Fuel Pump	480545	Purolator, for Maule Aircraft Corporation
Switch	MS24523-22 MS25306-222, or MS35058-22	Military Standard Part
Circuit Breaker	MS22073-2	Military Standard Part
Light Assembly	MS25041-8	Military Standard Part
Lamp	*MS25237-8918 or MS25237-330	Military Standard Part

*Indicates preferred component

AIRGLAS MODEL LT32PA-18 BELLY TANK

Functional Test and Leak Check

STEPS	INSTRUCTIONS
1	Make certain that the quick-drain fittings of the left wing fuel tank and the auxiliary fuel belly tank are closed. Partially fill the auxiliary fuel belly tank with approximately 4 gallons of fuel, taking care to properly ground both the fueling container or nozzle and the filler neck of the belly tank during the fueling operation.
2	Apply power to the airplane's electrical system by turning the master switch to the ON position. Press the lens on the "AUX. FUEL" annunciator light to test the lamp. The light should illuminate. If the light fails to illuminate, turn the master switch to the OFF position and replace the lamp with a new one. Then turn the master switch to the ON position and repeat the lamp press-to-test operation. When you have verified that the annunciator light illuminates when tested, proceed to Step 3.
3	Turn the "AUX. FUEL" switch to the ON position. The annunciator light should again illuminate and fuel should begin to transfer to the left wing tank at the rate of approximately 1/3 gallon per minute. Observe the airplane's ammeter. The auxiliary fuel transfer pump and its annunciator light should draw a total of not more than 1.1 ampere. Leave the "AUX. FUEL" switch in the ON position for 6 minutes. Then turn it to the OFF position. Verify by examination of the left wing tank sight gauge and, if necessary, by examination of the interior of the left wing tank, that approximately 2 gallons of fuel has been transferred from the auxiliary belly tank to the left wing tank. **CAUTION: Use only an explosion-proof lamp to illuminate the interior of the left wing tank for examination. DO NOT use a match or other open flame.** If substantially less than 2 gallons of fuel was transferred to the wing tank during the six-minute test, or if the operation of the transfer pump appeared to be deficient or abnormal in any way, proceed to Step 4. Then contact Airglas Engineering Company before proceeding further.
4	Check all auxiliary fuel transfer line connections to verify that they are free of leaks. If you discover any leaks, correct them immediately.

AIRGLAS MODEL LT32PA-18 BELLY TANK

Functional Test and Leak Check

STEPS	INSTRUCTIONS
5	Fill the left wing tank with fuel to its full capacity, taking care to properly ground both the fueling container or nozzle and the airplane during the fueling operation. Check all the fuel line, vent line, and sight gauge connections to the fittings on the left wing tank to verify that they are free of leaks. If you discover any leaks, correct them immediately.
6	Replace the cabin interior panels that were removed to install the auxiliary fuel transfer line. Replace the rear seat cushions if the airplane is to be operated with the rear seat occupied. Place the Airglas FAA Approved Airplane Flight Manual Supplement for Model LT32 Belly Tank in the airplane with the Airplane Flight Manual.

This completes the installation and testing of the Airglas Model LT32PA-18 Belly Tank.

AIRGLAS MODEL LT32PA-18 BELLY TANK

Completion of Alteration Records and Return of Airplane to Service

STEPS	INSTRUCTIONS
1	Complete FAA Form 337 (Major Repair and Alteration) at least in duplicate and make a similar record of the work accomplished in the airplane's maintenance records in accordance with FAR 43.9. The net weight change produced by the installation of the Airglas Model LT32PA-18 Belly Tank kit (not including the pump, electrical parts and tubing) is +32 pounds at +33.9 inches aft of the wing leading edge. The net weight change produced by the installation of the auxiliary fuel transfer pump, electrical components, and aluminum tubing and fittings not supplied with the kit is 3.1 pounds at +25.6 inches aft of the wing leading edge. Using this information, calculate the new airplane empty weight and CG position. Place the new weight and balance information in the airplane where it can be used by the pilot to calculate the airplane's loaded weight and CG position.
2	Have the airplane approved for return to service in accordance with FAR 43.5, by a person authorized to do so in accordance with FAR 43.7.