



SERVICE BULLETIN

Date of issue: April 2014

SB-42-017A-2014 Fuel system

Subject

1. Retro-fitting a fuel return line
2. Conversion of tank systems with 25 l tank cells to a 65 l tank

Applicability

1. All IKARUS C42, C42 B and C42 C up to and including serial number 1210-7226
2. All IKARUS C42 up to and including serial number 9902-6163 with 50l, 75l or 100l tank systems comprising 25l tank cells.

Compliance

Before 30.09.2014.

Effects on airworthiness

1. The retro-fitting of a fuel return line is mandatory in order to reduce the theoretical possibility of vapour formation.
2. Aircraft tank systems with 25l tank cells must be converted to a 65l tank in order to improve water separation when using modern fuels.

Classification

Service bulletin

Mass and balance

1. 0.38kg, no effect on centre of gravity
2. depending on original tank system
change in centre of gravity negligible

Electrical load

Not applicable

POH addendum

Update to C42 series, Issue 3, Revision 1



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Accomplishment instructions

Maintenance level	Intermediate
Qualification/Records	Qualified person Inspection by IFC/ISC/ITB or inspector Record in the logbook or similar
Necessary tools	Access to affected parts as per maintenance manual. Universal pliers, pinching pliers, scissors, screw-driver
Necessary material	1. Retro-fit kit "fuel return line" 2. Retro-fit kit "65 litre tank"

Attention!

During work on the fuel system, smoking and any kind of open fire or flame are prohibited near the aircraft. A warning sign must be positioned so that it is visible for third parties. Adequate ventilation must be in place. It is essential that no foreign objects remain behind in the tank. Should this occur, the tank must be cleaned and vacuumed using a thin extension tube. It is better to remove the tank to accomplish this.

Before beginning this work, the engine should be allowed to cool off.

1. Fuel return line

- a) Drain the fuel via the drainage lines into a suitable container or disconnect the fuel line between the fine filter and the bypass and shut the fuel cock.
- b) Attaching the rubber grommet to the fire wall (Photos 1 and 2)
 - Bore a hole (ø 20 mm) in the fire wall
 - Fit the rubber grommet into the fire wall so that the fire wall cannot damage the line.
- c) Attaching the T-fitting with the reduction nozzle in the retrofit kit (Photo 3)
 - Cut off the supply line to the left carburettor about 160 mm from the distributor T-fitting
 - Shorten the line to the carburettor by about 15 mm
 - Slip the Cobra bracket supplied (purple, ø 11.5 mm) on to the end of the tubes and connect the T-fitting with the reduction nozzle (outlet to the return line slightly upwards $\geq 20^\circ$)
 - Secure the cobra bracket using suitable pliers (universal pliers, pinching pliers)



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d) Attaching the fuel return line to the tank (Photo 6)

- Using a scribe heated to about 120 °C (hot-air pistol) bore into the tank in the existing screw-hole at the front left of the tank upper side
- Screw in the return connector in the existing screw-hole and apply supplied sealant "Hylomar". (alternatively "Marston" or 2-component adhesive "Ergo 1955")

Note: If the necessary preparations for the return connector (screw-hole in the tank) are missing in the tank systems built between 1999 and 2001, a petrol-resistant rubber bushing with return connector may be used as an alternative. In this case a hole $\varnothing$ 12.5 - 13.0 mm must be bored at the front left of the tank upper side.

Attention! Make sure that no splinters fall into the tank or vacuum the tank after completing work via the opening for the fuel sensors.

e) Attaching the fuel return line (Photos 2 and 8)

- Position the supplied return line parallel to the existing fuel line
- Feed the front end through the rubber grommet into the engine compartment (Photos 2 and 3)
- Lay out the rear end parallel to the fuel line placing it over the cross-beam and under the fuselage tube, feeding it to the right side of the aircraft and then upwards behind the seat (Photos 4 and 5)

Note: The fuel return line must be positioned so that it cannot be pinched or damaged along its entire length, and particularly between the seat and diagonal strut.

- Fit the appropriate Cobra ring (purple, $\varnothing$ 11.5 mm) to both ends of the return line
- Fit the return line to the T-fitting on the carburettor tube and secure the Cobra ring with pliers
- Fit the return line to the return fitting and secure the Cobra ring with pliers
- Secure the T-fitting and the return line to the carburettor tubing using tie wraps
- Near the tank secure the return line to the B-strut using tie wraps

f) Exchanging the by-pass and T-fitting with the reduction nozzle through the supplied by-pass

- Loosen a Cobra ring on the front (Photo 9, red arrow A) and two on the rear T-fitting (Photo 9, white arrows B) using pliers and remove the T-fitting with the reduction nozzle and the by-pass
- Attach the supplied by-pass with the check valve (arrow points in the direction of flight) and the T-fitting using a new Cobra ring (black, $\varnothing$ 12.0 mm) and secure with pliers.



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Photo 1: Feed-through through the fire wall

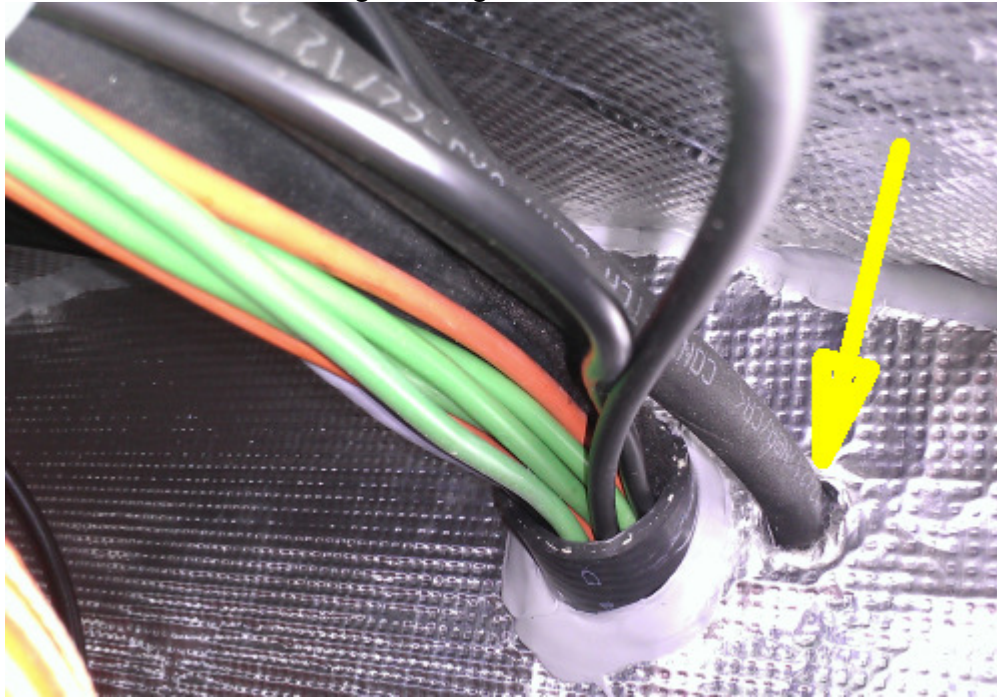
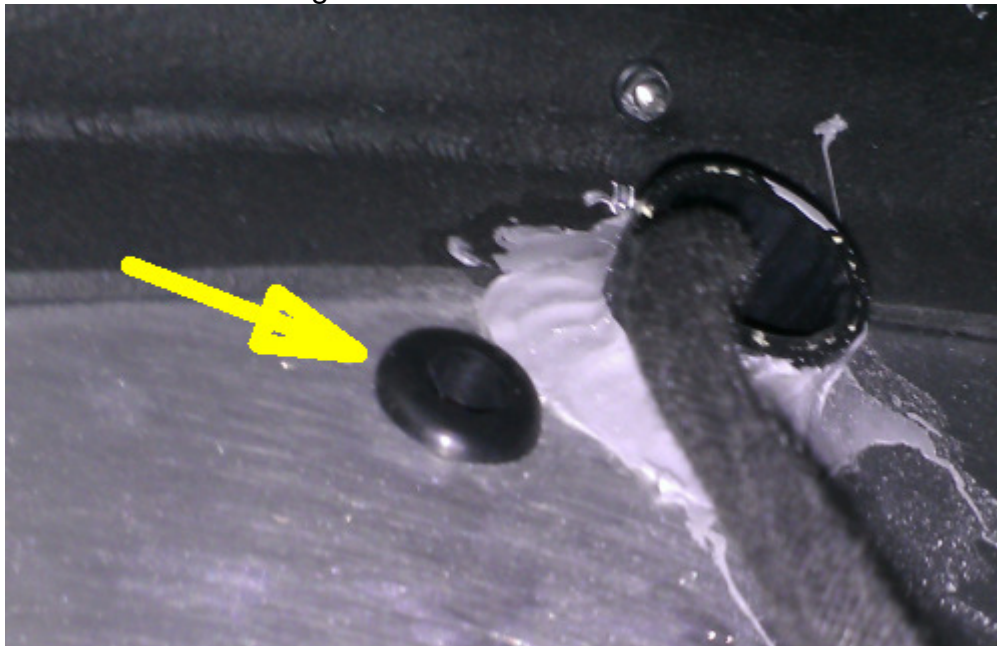


Photo 2: Rubber grommet





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Photo 3: T-fitting with reduction nozzle

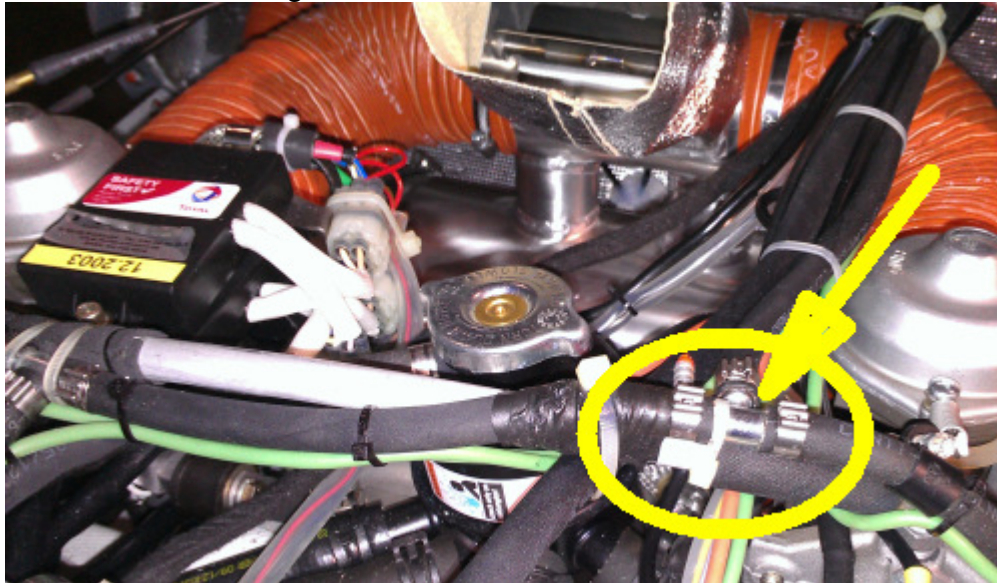


Photo 4: Return line





COMCO IKARUS GmbH, Flugplatz Mengen, 88367 Hohentengen,
Tel.: (+49) 7572 – 60080 Fax: (+49) 7572 – 3309
E-mail: post@comco-ikarus.de Internet: www.comco-ikarus.de

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Photo 5: Return line



Photo 6: Screw connection for return line (prepared tank)





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Photo 7: Return line connected



Photo 8: Return line with rubber bushing (unprepared tank)





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Photo 9: By-pass

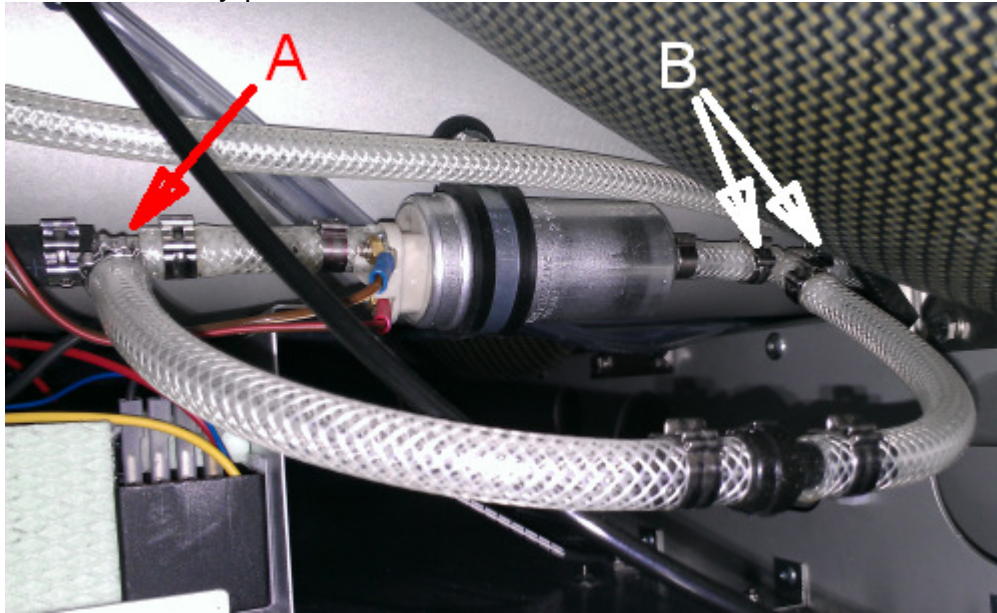
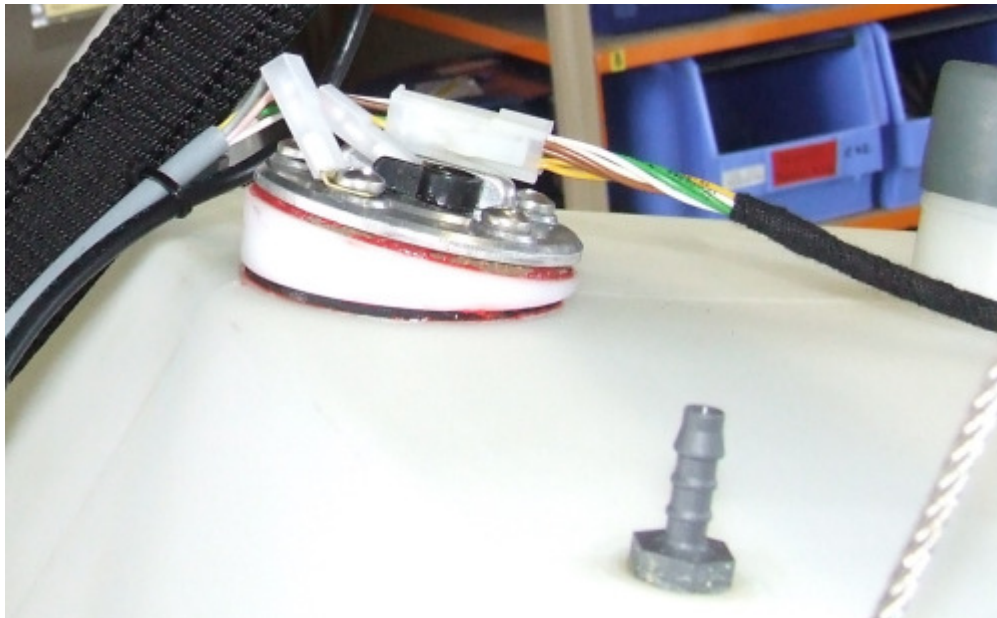


Photo 10: Fuel level sensor





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2. Converting to a 65-litre tank

We recommend that the conversion be carried out by one of our partners IFC/ISC/ITB.

It is recommended that the upper fuselage shell be removed when retro-fitting the 65-litre tank.

a) Removing the 25-litre tanks

- Drain the fuel into an appropriate container
- Shut the fuel cock
- Remove the fuel level sensor (unscrew tank cap with fuel level sensor)
- Remove the tank filler tube (unscrew tank cap)
- Disconnect the tank connection tube, the drain tube and fuel supply line
- After loosening the tank braces and mountings - remove the 25-litre cells

b) Installing the new 65-litre tank system

- After removing the transportation lock on the new fuel level sensor, check functioning of the float gauge by vertically rotating the sensor. A slight knocking indicates that the float is in the upper or lower end setting.
- Attach the new fuel level sensor to the sensor wiring to calibrate the fuel level indicator (fuel level sensor in the lower float position)
- Calibrate the fuel level indicator by turning the calibration screw on the side of the fuel level indicator with an appropriate screw-driver. Set the indicator to the lower edge of the wedge-shaped display area. Remove sensor wiring before installing the new fuel level sensor.
- Install the new fuel level sensor using angular spacers, rubber seals and attachment screws

Attention: Pitch circle of the fuel level sensor is not symmetrical - it only fits in one position (Photo 10)

Important: The fuel level sensor must be in place before installing the new tank with the fuselage shell closed. Subsequent positioning with the fuselage shell closed is difficult.

- Attach the welded support bracket for the lower tank strut (as per Photo 11)
- Place the tank strut on the support bracket and secure to the B-column using hose clips (Photo 12)
- Attach the new tank braces (as per Photo 13)
- Attach the new tank to the tank struts using the tank braces (Photo 14)



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The lower tank brace should be folded around the edges of the tank to prevent the braces from slipping (Photo 15)

- Connect a fuel line (ø 8mm) to the upper fitting of the tank sump using a Cobra ring (black) and attach to the aircraft-side of the system at the fuel filter
- Connect the draining tube (ø 6 mm) to the lower fitting of the fuel sump using a Cobra ring (purple)
- Attach the return line (ø 6 mm) to the return fitting on the upper side of the tank using a Cobra ring (purple)
- Attach the filler tube to the filler fitting using a hose clamp (Photo 16). To ensure the connection is tight, tighten the supplied hose clamps to the end of the threading. Add a little grease to help with tightening
- Attach the new vent line (PVC corrugated tube) to the vent fitting on the upper side of the tank and lay the tubing to the feed-through in the lower fuselage shell (Photo 17)

Note: Do not over-tighten the tie wraps when securing the return line. The PVC tube could otherwise rupture after extended periods of operation. Feed the vent tube through a new feed-through behind the tank and secure against shifting using tie wraps

- Before re-assembling the upper fuselage shell, check functionality of the tank system and against leakage. (Fill in a little fuel; switch on the electrical fuel pump; check fuel return; the fuel level indicator should react once approx. 5 litres of fuel has been filled into the tank).
- In some cases it may be necessary to replace the filler fitting in the upper fuselage shell. To install the new filler fitting, a hole (ø 50 mm) must be bored into the right upper side (hole circle saw, Dremel, or similar). The tank fitting is attached to the fuselage shell using M4 counter-sunk screws and stop nuts.
- The new tank filler tube with the filler fitting is then attached to the fuselage shell in the same way, as in the case of the new tank. Horizontal sections and tight curves impede fuel flow and can lead to fuel accumulation during refuelling
The old tank fitting may be shortened and remain in place but should be sealed in order to prevent accidental filling. Alternatively, a decal may be used to block the old hole.



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Photo 11: Welded support bracket

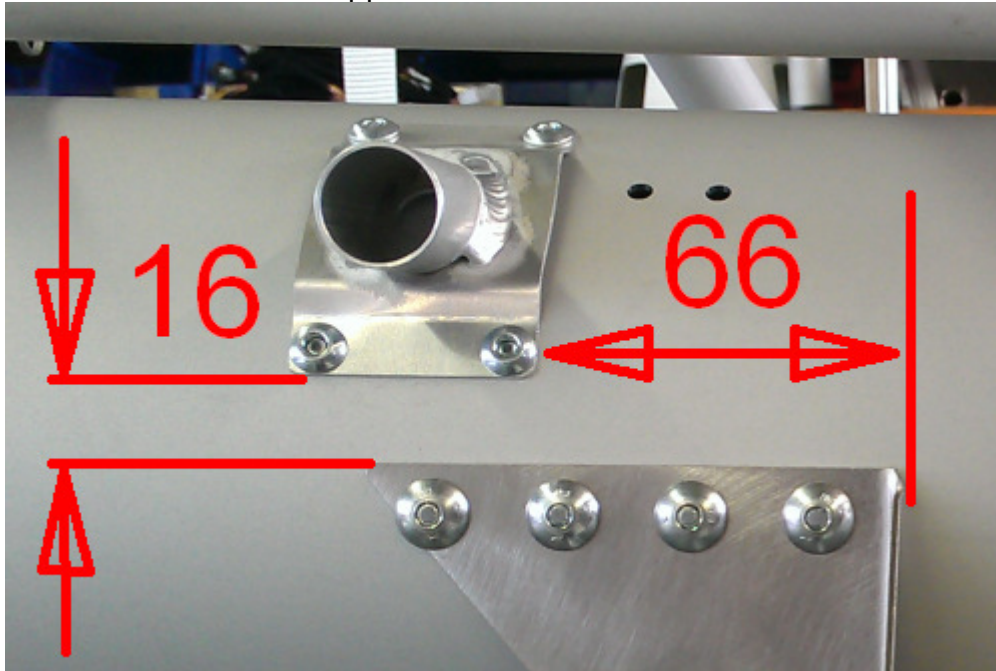
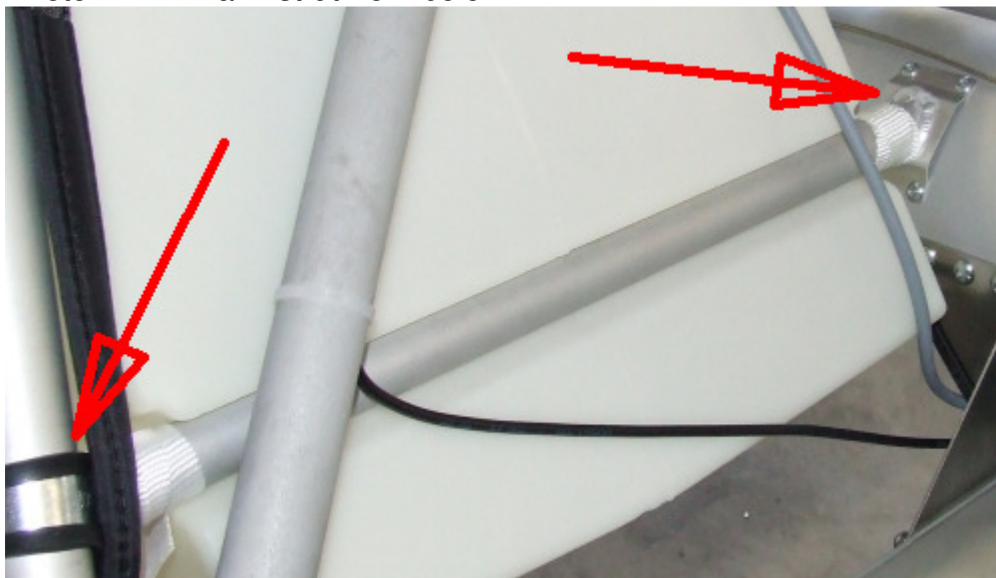


Photo 12: Tank strut from below





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Photo 13: Tank brace



Photo 14: Tank installation (photo rotated)





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Photo 15: Tank brace from below



Photo 16: Filler tube connection





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Photo 17: Tank venting

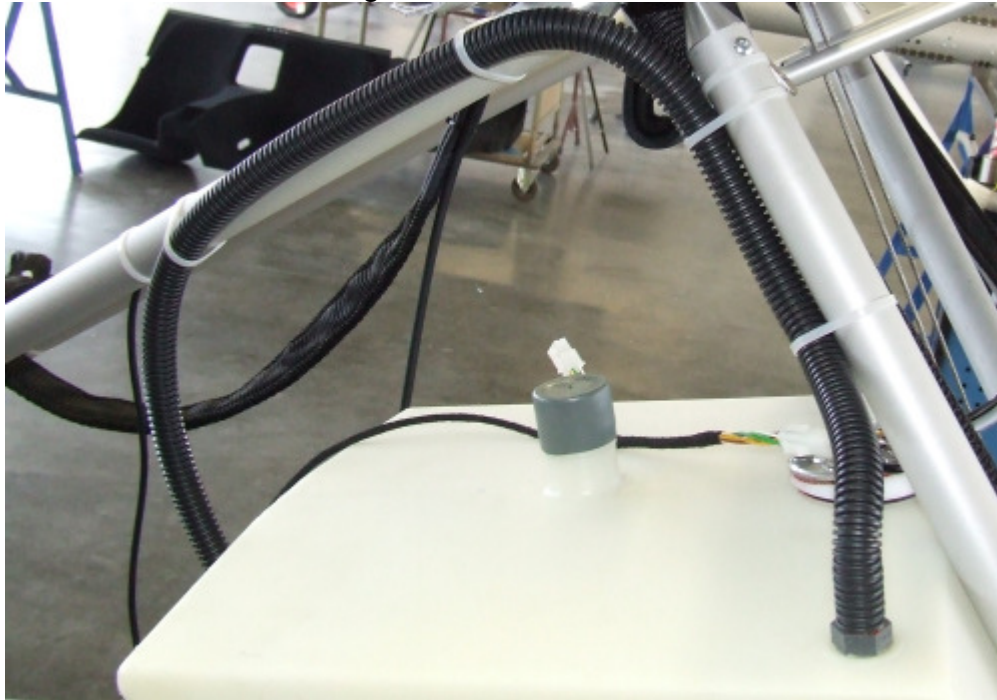


Photo 18: Position of tank fitting (photo rotated)

