

**Addendum 1 to  
Pilots Handbook  
Gyroplane Type MTOsport (UK spec only)**

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## Applicability

<b>Aircraft Registration:</b>	<b>G-</b>
<b>Aircraft serial no.</b>	<b>RSUK/MTOS/</b>
<b>Engine type:</b>	<b>Rotax 912ULS or 914UL</b>
<b>Engine serial No:</b>	
<b>Rotor blade type &amp; diameter:</b>	<b>Autogyro 8,4m Rotor system (black end-caps) or Autogyro 8,0m Rotors system (grey end caps) or Autogyro 8.4m RotorSystemII (red caps only) when modified under SB-040 Iss1 or Autogyro 8.4m RotorSystem II TOPP (blue caps only) when modified under SB-040 Iss2</b>
<b>Propeller type:</b>	<b>HTC 1,73m ground adjustable propeller or Woodcomp SR3000/3 in-flight variable pitch propeller or IVO-prop DL3-68 in-flight variable pitch propeller</b>

## **NOTE!**

**This autogyro may be operated only under adherence to the operation limits and the information contained in this manual. The manual should be carried on board the aircraft.**

**The manual is not a replacement for theoretical and practical training as to how to operate this machine. Failure to adhere to its provisions or to take proper instruction can have fatal consequences**

**AMENDMENTS CONTROL PAGE**

1. Where & when necessary RotorSport UK Ltd (hereafter referred to as RSUK) will issue updates to this maintenance standard, and will notify known owners to review the changes via the RSUK website with changes appropriately identified by a strike in the margin.
2. Aircraft operators are responsible for ensuring that amendments to their publication are carried out immediately and in accordance with instructions contained in amendment transmittal letters (where issued).

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RotorSport UK Ltd approval signatures for this Pilot Handbook		
Signature:	Signature:	Signature:
Position: Author	Position: Test Pilot & Eng. Manager	Position: Head of Airworthiness

## 1. INTRODUCTION

This addendum to Pilots Handbook RSUK0043 describes the operational requirements for the ferry-tank system first installed in G-CHIT in May 2017.

- Section 2 describes how the ferry-tank and pipework system is installed, and must be re-installed after temporary removal
- Section 3 describes use of the tank and associated systems
- Section 4 defines limits and recommendations

## 2. INSTALLATION

### 2.1. Ferry tank location and characteristics

The 25USG bladder-construction ferry tank is a proprietary part manufactured by Turtle-Pac of Queensland, Australia (see <http://www.turtlepac.com/products/collapsible-jerry-can-fuel-tanks/>). The ferry tank is installed in the rear seat position of the gyroplane making use of the standard seat belts passing through the adjustable straps that are part of the bladder construction. Additionally, an adjustable strap is provided to constrain (in width) the two shoulder straps, and automotive seat-belt protection sleeves are provided to ensure no chafing of the bladder by the seat belt buckles.

The maximum weight of the filled tank is 72kg, the rear seat and harness are designed and approved for an occupant weight 120kg so no secondary restraint system is required.



**DRUM 25 GALL. 94LT**  
**DRUM 33 GALL. 125LT**

**FEATURES**



Designed to sit on a single seat of any aircraft. One 18 gal. seat fuel tank of 25 and 33 gal. capacity models.

The collapsible cylinder shaped tank sit as a person on the seat and secured by the aircraft's passenger seat belt. Shoulder or lap belt suitable.

Filled via a 2" filter on lay flat hose that rescues outside the fuselage for filling and sucks back into cabin for flight. Outlet on bottom at back of seat is AN-6 3/8".

Outlet is connected to a 12 V. or 24 V. in-line transfer pump kit filled with cigarette lighter plug for power source.

[www.turtlepac.com](http://www.turtlepac.com)  
Australian Made Email: [turtlepac@yahoo.com.au](mailto:turtlepac@yahoo.com.au)



12 VOLT IN-LINE FUEL PUMP 4 3/8" 3/8 MM HOSE 4 FT ONE GALL. PER MINUTE TRANSFER OR 24 VOLT IN-LINE FUEL PUMP 6 FT 1/2 GALL. PER MINUTE TRANSFER.

ALLOY TOP PLATE 2" FLUSH OR LAY FLAT HOSE 2/3 CLAMPS

HEAVY DUTY ELECTRO FUSE BEAMS

SEAT BELT GUIDES X 5 RATED 250 KG EACH. (SEAT BELT & SEAT HOLDS WEIGHT)

OUTLET UNDER TANK WITH ELBOW 3/8" HOSE & VALVE

**DRUM 25** - 18 gal. model - storage table 225 lb. 30000 lbs. structure. 2.5/2.75" dia. x 12" x 12" dia.

**DRUM 33** - 25 gal. model - storage table 325 lb. 30000 lbs. structure. 2.5/2.75" dia. x 12" x 12" dia.

**CARRY VALISE WITH HANDLES**

**PANEL SWITCH & DOUBLE SIDED ADHESIVE TAPE TO SECURE CIGARETTE LIGHTER PLUG CONNECTOR**

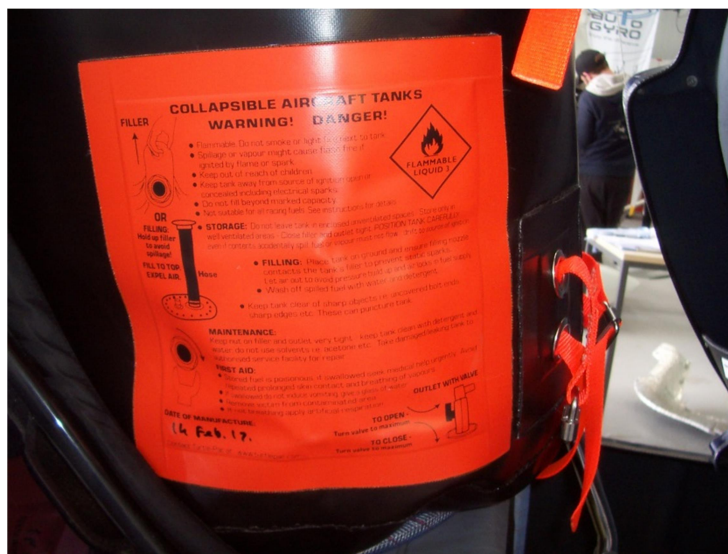
**IN LINE FUEL FILTER**



CAPACITY		FILLED DIMENSION				EMPTY WEIGHT		FILLED AVBAR		FILLING JET	
US	UK	Depth	Width	Height	lbs.	kg	lbs.	kg	in.	mm	
25	94	18"	12"	25"	25	11.3	110	50	7 1/2"	191	
33	125	20 1/2"	12"	25 1/2"	35	15.9	125	57	8 1/2"	216	

DESIGN REGISTERED

The photographs below show the approved installation method which should be followed at all times. Before lifting the ferry tank into position the seat back and cushion (which must be left in place) should be carefully inspected to ensure there is no debris that may damage the bladder.



Turtle-Pac Instructions on tank surface



Adjustable width strap      Protection sleeve



Tank collapsed to 10 litres remaining  
(Minimum level to ensure that the shape is suitable for retention in the seat)

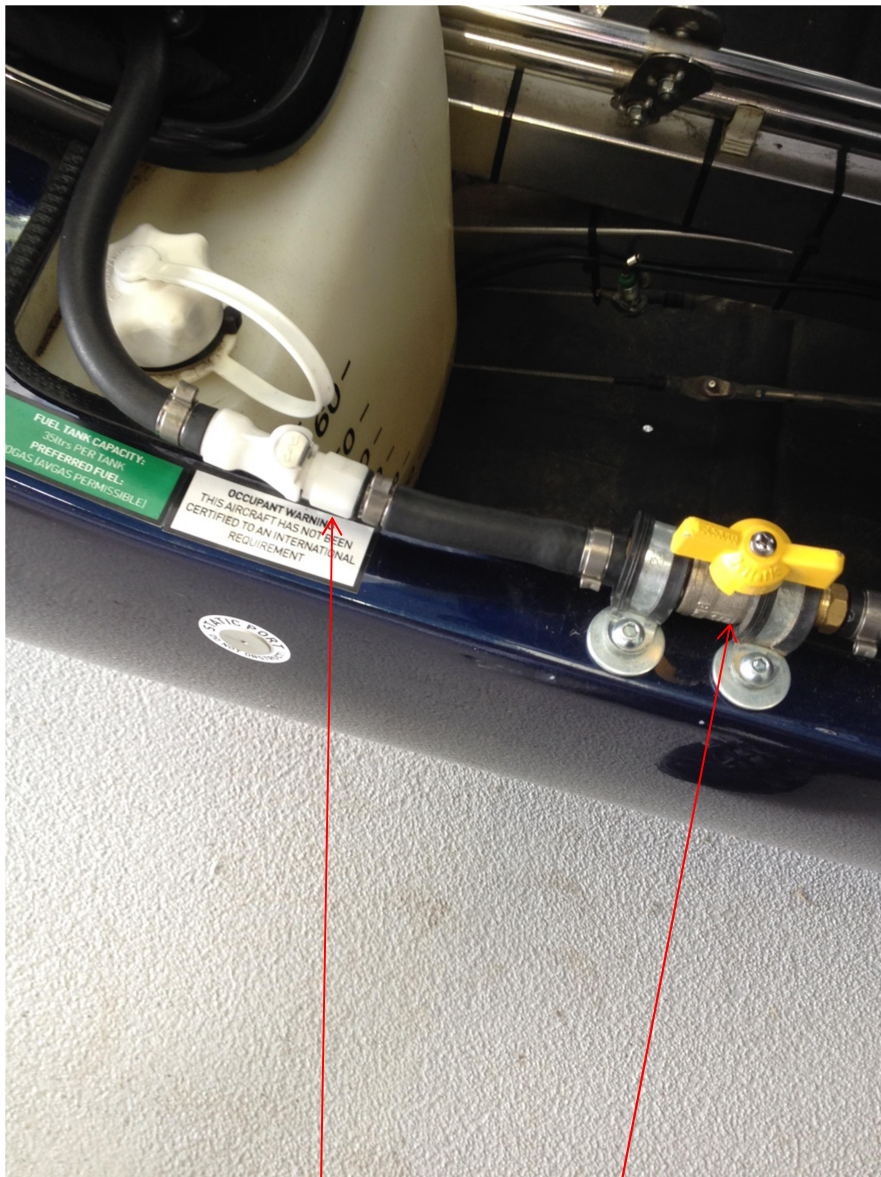
When the ferry tank has been filled (see Turtle-Pac instructions) all straps should be pulled tight and the protection sleeves used to protect the bladder from excess pressure from the seat-harness buckles. The bladder should be carefully inspected for damage, leaking or weeping fuel.

## 2.2. Ferry tank connections

The output from the ferry tank is fitted with a quick-release/self-sealing connector. The mating quick-release/self-sealing connector is fitted to a stub-pipe attached to the fuel transfer tap.

- Quick-release is achieved by pressing the metal tab on the female connector.
- Engagement is achieved by pushing the connectors home until a click is heard or felt.
- Engagement should be tested by gently pulling the connectors

When not mated the stub-pipe should be secured with a cable-tie



QR self-sealing connector

Transfer tap in "on" position



The fuel delivery pipe exits from the underside of the ferry tank and lies naturally around the profile of the seat cushion. After passing through the quick-release connector and fuel transfer tap the pipe runs downwards and backwards to a fitting in the top of the right-hand aircraft tank.



The fuel pipe is of an RSUK approved material (Semperit FUHT) and must not be substituted.

### 3. Operation

#### 3.1. Fuel Management without ferry tank fitted.

The aircraft may be flown with the tank removed provided the transfer tap is in the closed position and the seat belts and cushions are secured in the normal way. (See Pilots Handbook RSUK0043 for further information on fuel management with a standard aircraft configuration).

#### 3.2. Fuel management with ferry tank fitted

The ferry tank should be filled as described in the Turtle-Pac publication shown below

**INSTALLATION OVER-VIEW**

**WARNING!**  
MAXIMUM dry run 8 min. Longer will damage pump!

**WARNING!**  
DO NOT FEED ENGINE DIRECT FROM FERRY TANK!

**WARNING!**  
ALWAYS TEST RUN WITH FUEL AUXILIARY ON THE GROUND, IF YOU ARE NOT 100% SATISFIED WITH THE OPERATION THEN DO NOT FLY!

**FUEL TRANSFER DURING FLIGHT:**  
Contacted main tank should be used first to about half its capacity. Then needs to switch to opposite wing for engine feed - then transfer fuel to unselected tank (empty tank) - then back to topped up main tank.

**AFTER USE MAINTENANCE**

1. Remove tank to refresh age. Inflat with air - recommended best practice is to dry out tank and store inflated at approx. 1 psi.
2. With time fabric layers compress, dry - fabric needs drying from time to time. Best time to tighten ribs as tanks inflated to 2 psi.
3. When off spilled fuel or dirt, tank must be kept 'as new' clean at all times! Use detergent and NEVER USE SOLVENTS AS ACETONE!
4. Report on for dry wear and tear and contact Turtle-Pac for further advice.

Please appreciate we do not want our name mentioned in VULPI accident reports...

If you have any questions or complaints, please contact Turtle-Pac direct for motor services. Your satisfaction is very important to us.  
Australia ph/vex 07 6509 1260. us ph/vex 01 7 6396 1955. Web: www.turtlepac.com. Email: turtlepac@yahoo.com.au

**WARNING!**  
BREACHING INSTRUCTIONS Voids INSURANCE AND WARRANTY

**TURTLE-PAC**  
EXPERIMENTAL CATEGORY INSTALLATION

**Turtle-Pac Ferry Tanks are designed to be used in well ventilated aircraft cabins. THE TANKS ARE SUITABLE FOR FUELS & MARKED ON TANKS. DO NOT USE WITH OTHER FUELS. Observe normal precautions against fire and spillage at all times. Only fill to the lesser rated capacity and the maximum allowed by weight & balance data or specific operational approval. Consult Turtle-Pac for advice if intending to use other fuels.**

**BEFORE USE:**  
Prepare cabin for tank:  
Keep the seat cushion, do not remove it.  
Make certain the area for tank usage is free of sharp points / edges or objects, run your hands over the surface to feel. Do not rely on looking alone. Cover ball ends with dome nuts and round off or cover over other sharp points - edges. Lay a soft carpet under tank is a wise and inexpensive precaution, off seat use.

**Before use safe practice:**  
Before day of use, inflate tank with air overnight to 2 psi approx. Make sure fittings are tight. Note room temperature. Tank should visibly hold pressure as long as temperature does not decrease by more than 15°C (5°F). If there is visible decrease in pressure, inflate tank to 2 psi and with thick soapy foam using a syringe, look for moving bubbles. Check on filler cap, and fittings for leaks. If any found, retighten them.

**FILLING:** Fill up tank ONLY a couple of hours before imminent departure! After making sure weather and other considerations will not delay departure, DO NOT STORE FUEL IN TANK UNLESS DEPARTURE IS IMMINENT.

**DRUM 25-35: Filled on seat - positioned as outlet is at lowest point - All air is expelled - tank's bottom smooth - seat belt secured loose only thru belt guides.**

**FILLING (PLATE / HOSE FILLER):**  
Keep clear of any flames or ignition sources! As tank becomes full, lower hose to expel air - gently push tank top to assist process - close cap. Do not spill fuel!  
FILL TO RATED CAPACITY. Close cap then firmly tighten up webbing ties. AIR MUST BE EXPELLED!  
Have detergent and wiping cloth ready in case fuel is spilled.

**WARNING!**  
Failing to expel air can cause air lock in transfer pump and fuel vapour is explosive in case of crash or fire! Further expanding vapour will increase pressure in tank reducing crash resistance strength.

**DO NOT FILL MORE THAN STENCILED RATED CAPACITY! IF DO. Built in safety margin excess will be used up and tank's strength will be reduced in case of crash! Using the ability to slightly move with high G loads rather be hollow like for easier to puncture. Higher the flight altitude greater is the inner pressure of a full tank and over filling can increase pressures over rated working pressure. Wash off any spill of fuel, tank must be kept 'as new' clean at all times! Use detergent NEVER USE SOLVENTS OR ACETONE!**

In order to maintain the correct "collapsed" shape of the ferry tank its minimum fuel level should be 10- 20 litres remaining.

### 3.3. Use of ferry tank fuel transfer tap

This is located on the right-hand edge of the cockpit behind the pilots seat.

- In the “off” condition (lever pointing crossways) the fuel tap is closed (when turned against the stop)
- In the “on” condition (lever pointing in-line) fuel is transferred by gravity from the ferry tank to a fitting located in the top of the aircraft’s right tank (when turned against the stop).
- Between these two positions fuel flow is partial and unpredictable, so only the two stop positions should be used.

### 3.4. Fuel transfer rate

The data below is approximate and dependent on aircraft attitude. The transfer tap must be fully opened (against the stop).

Full tank, 94ltrs, 2l/min  
40ltrs remaining, 1.6l/min  
20ltrs remaining, 0.8l/min

### 3.5. Recommendations for use of the ferry-tank system

- 1) Prior to flight ensure that the quick-release/self-sealing connector between the ferry tank and the aircraft pipework is fully home.
- 2) The contents of the ferry tank (as well as the aircraft tanks) should be known by observation and calculation at all times.
- 3) When the chosen transfer point is reached (e.g. aircraft tanks observed half-full), fuel transfer should be initiated until the level in the aircraft tanks reaches that required, at which point the transfer tap should be closed.
- 4) The ferry tank should be drained no lower than 10 – 20 litres remaining, to ensure that the “collapsed” shape of the bladder is properly retained in the seat
- 5) Note that with a full ferry tank (94 litres), if the fuel tap is left open with full aircraft tanks then the head of fuel in the ferry tank will pressurise the aircraft tanks and pipework. Although there is no inherent problem in this (as the breather pipe has been extended to a position above the ferry tank), if the aircraft tank filler-caps have been left loose then there would be fuel leakage. It is therefore essential that these are checked tight before flight.

## 4. OPERATIONAL LIMITS AND RECOMMENDATIONS

### 4.1 Introduction

The published limits for operation with the ferry tank installed are unchanged from those in the MTOsport Pilots Handbook RSUK0043 Issue 9.

However, the pilot is reminded that as the fuel is extracted from the ferry tank, the tank becomes increasingly slack in the harness. Whilst the tank is considered safe and secure in the aircraft, flight conditions may cause flapping of the tank. If that occurs, reduce speed to 80mph or less as required.

For the same reason it is also recommended that the fuel level in the ferry tank it is allowed to fall no lower than approx. 10 litres, in order that the body shape of the bladder is maintained on the seat.

### 4.2 Refuelling

The following is an extract from Pilots Handbook RSUK0043:

*The engine manufacturer recommends unleaded gas station premium fuel (MOGAS). AVGAS 100LL can be used, although not recommended for long term operation, as the lead in the fuel causes excess plug fouling and problems with the slipper clutch – refer to the engine manual for further information. Alternatively, unleaded aviation gasoline Avgas UL91 is now available at some airfields and is approved for use with Rotax engines.*

*MOGAS should not be used if the fuel temperature exceeds 20°C or at altitudes above 6000ft due to the increased risk of vapour bubble formation in fuel lines. In these conditions AVGAS 100LL should be used. Note: MOGAS E10 (unleaded gasoline blended with 10% ethanol) is not recommended.*

Both water-separating and debris removal filters must be used when the ferry tank is being filled and there is any doubt of fuel quality.

### 4.3 Weight and Balance

The maximum take-off weight (MTOW) of the MTOsport is 500kg. Marked on the aircraft, and on the aircraft AWC, is the *actual* aircraft empty weight with minimum required equipment. The Payload is the MTOW minus the empty weight, and represents the allowance available for occupants, fuel (within both aircraft tanks and ferry tank) and luggage.

If any accessories are fitted which increase the empty weight of the aircraft then the aircraft's maximum payload must be reduced accordingly.

The pilot is responsible for ensuring the aircraft is not flown overweight.

#### 4.4. Pre-flight checks

In addition to the items in the check-list provided in POH RSUK0043, the following should be checked before flight:

- Inspect the security of all straps and harnesses
- Inspect the bladder for damage, leaking or weeping fuel.
- Inspect the fuel delivery pipe and fittings for leaking or weeping fuel
- Check complete engagement of quick-release connector
- Check that the fuel transfer tap is free to operate then set to the closed position.
- Check that the aircraft tank filler caps are correctly fitted and tight

In addition water contamination of fuel should be checked very carefully (as described in Pilots Handbook RSUK0043), due to the extra volume of fuel carried