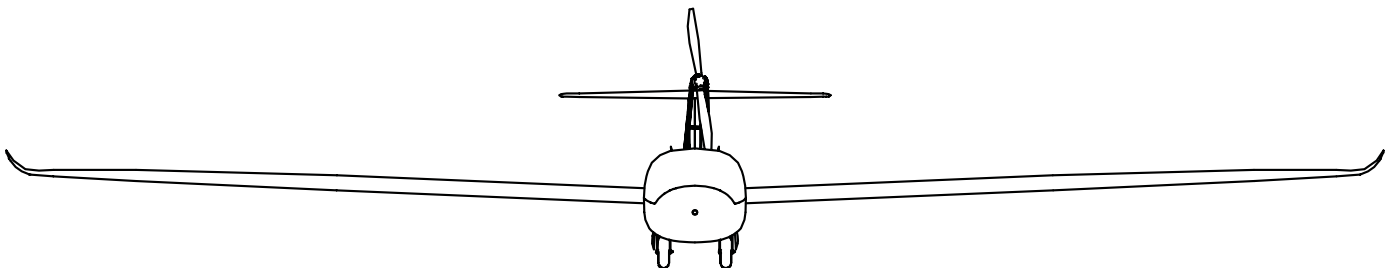




Flight manual and Maintenance manual

applies to Taurus 503 equipped with Rotax 503 engine



REV. 0
(21 June, 2006)

This is the original manual of Pipistrel d.o.o. Ajdovščina
Should third-party translations to other languages contain any discrepancies,
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WARNING!

This booklet **MUST** be present inside the cockpit at all times!
Should you be selling the aircraft make sure this manual is handed over to the new owner.

Taurus model:

Factory serial number:

Date of manufacture:

Aircraft empty weight (kg):

Available crew weight (no front ballast):

Available crew weight (9 kg front ballast):

Available luggage weight:

List of equipment included in aircraft empty weight:

Date and place of issue: **Ajdovščina,**



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Flight manual and Maintenance manual for



Taurus motorglider

Model: Taurus 503 (Rotax 503)

Slovenian Data Sheet number: TC 02/001 - AT/ULN 04

Factory serial number:

Registration number:

Date of Issue: June, 2006

Pages signed under "Approval" in section Index of revisions and List of valid pages
(pages 4 and 5 of this manual) are approved by:

Authority: MINISTRY OF TRANSPORT, REPUBLIC OF SLOVENIA

Signature: J. J. J. J. J.

Stamp:

Original date of Approval: 22/02/2007

This aircraft is to be operated in compliance with information and limitations contained herein.
The original English Language edition of this manual has been approved as operating instruction
according to "Pravilnik o ultralahkih letalnih napravah" of Republic of Slovenia.
Approval of translation has been done by best knowledge and judgement.



List of valid pages

This manual contains 92 original and revised pages listed below.

	Pages	State (Revision)	Approval:
Cover		Original	Subanik
Page numbering		Original	Subanik
Authority approval sheet	3	Original	Subanik
Index of revisions	4	Original	Subanik
List of valid pages	5	Original	Subanik
Table of contents	7	Original	Subanik
General	9-12	Original	Subanik
Limitations	13 - 20	Original	Subanik
Emergency procedures	21 - 26	Original	Subanik
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CAUTION!

This manual is valid only if it contains all of the original and revised pages listed above.



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Weight and balance

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General



Introduction

Certification basis

Notes and remarks

Technical data

3-view drawing

Introduction

This manual contains all information needed for appropriate and safe use of Taurus ultralight motorglider model 503.

IT IS MANDATORY TO CAREFULLY STUDY THIS MANUAL PRIOR TO USE OF AIRCRAFT

In case of aircraft damage or people injury resulting from disobeying instructions in the manual PIPISTREL d.o.o. denies all responsibility.

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Certification basis

PIPISTREL d.o.o possesses the manufacturing licence ULN no.: P-03 issued by URSZP (SI-CAA) for Taurus ultralight motorglider.

Taurus ultralight motorglider is certified at URSZP according to the standards of the Republic of Slovenia and the ATTESTATION OF AN ULTRALIGHT DEVICE

**no. TC02/001-AT/ULN04, issued
18.5.2002**

as an Ultralight aircraft.

Notes and remarks

Safety definitions used in the manual:

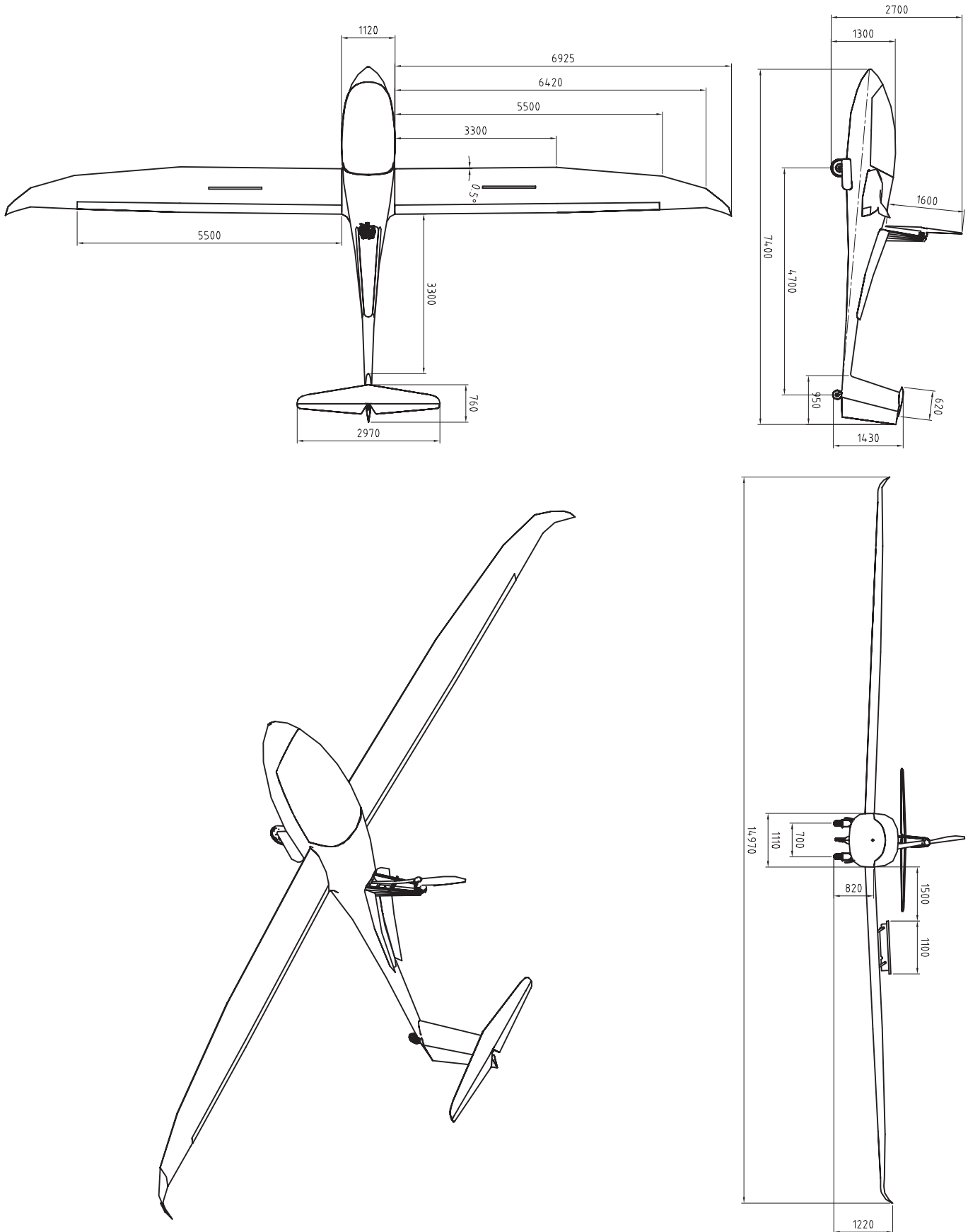
WARNING! DISREGARDING THE FOLLOWING INSTRUCTIONS LEADS TO SEVERE DETERIORATION OF FLIGHT SAFETY AND HAZARDOUS SITUATIONS, INCLUDING SUCH RESULTING IN INJURY AND LOSS OF LIFE.

CAUTION! DISREGARDING THE FOLLOWING INSTRUCTIONS LEADS TO SERIOUS DETERIORATION OF FLIGHT SAFETY.

Technical data

PROPORTIONS	Model 503
wing span	14.97 m
length	7.40 m
height (propeller extended)	2.7 m
wing surface	12.33 m ²
vertical fin surface	0.9 m ²
horizontal stabilizer and elevator surface	1.36 m ²
aspect ratio	18.6
positive flap deflection (down)	5°, 9°, 18°
negative flap deflection (up)	-5°
centre of gravity (MAC)	20% - 45%

3-view drawing





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Limitations



Introduction

Operational velocities

Engine, fuel, oil

Weight limits

Centre of gravity limits

Manoeuvre limits

G-load factors

Cockpit crew

Types of operations

Minimum equipment list

Other restrictions

Warning placards

Introduction

This chapter provides information about operational restrictions, instrument markings and basic knowledge on safe operation of aircraft, engine and on-board appliances.

Operational velocities

Speed limits

	Velocity	IAS [km/h (kts)]	Remarks
VNE	Velocity never to be exceeded	225 (122)	Never exceed this speed. Should the VNE be exceeded, land as soon as possible and have the aircraft verified for airworthiness by authorised service personnel.
VPE	Max. speed with powerplant extended	160 (86)	Do not exceed this speed with powerplant extended.
VPO	Max. speed to extend or retract powerplant	100 (55)	Do not extend or retract powerplant above this speed.
VRA	Maximum safe velocity in rough air	163 (88)	Also known as V _b . Turbulence penetration speed.
VA	Manoeuvring velocity	163 (88)	Do not use rough or full stick and rudder deflections above this speed.
VFE	Max. velocity flaps extended	130 (70)	Do not exceed this speed with +9° flaps extended. (VFE for full flaps is 110 km/h)
VAE	Max. velocity of airbrake extension	160 (86)	Do not extend spoilers above this speed.
VLO	Max ldg. down speed	160 (86)	Do not fly with landing gear extended above this speed

Airspeed indicator markings

MARKING	IAS [km/h (kts)]	Definition
white arc	63 - 130 (34 - 70)	Speed range where flaps may be extended. Lower end is defined as 110% of V _S (stall speed in landing configuration at MTOM), upper end of speed range is limited by VFE (see above).
green arc	75 - 170 (41 - 92)	Speed range of normal operation. Lower end is defined as 110% of V _{S1} (stall speed at MTOM with flaps in neutral position), upper end is limited by VRA (see above).
yellow arc	170 - 225 (92 - 122)	Manoeuvre the aircraft with great caution in calm air only.
red line	225 (122)	Maximum speed allowed.
blue line	100 (54)	Best climb rate speed (V _γ)

WARNING! ABOVE PRESSURE ALTITUDE OF 1000 METERS (3300 FT) ALL SPEED LIMITS MUST BE TREATED AS TRUE AIRSPEED (TAS). INDICATED AIRSPEED (IAS) MUST BE REDUCED ACCORDINGLY!

Indicated airspeed (IAS) to true airspeed (TAS) relation

Airspeed indicator measures the difference between total and static pressure (also called dynamic pressure), which does not only change as speed increases, but is also linked with altitude. Flying at high altitudes, where the air is getting thinner, results in misinterpreting airspeed which is being indicated. The indicated airspeed value is actually lower than the true airspeed to which the aircraft is exposed. The higher you fly, the bigger the difference between IAS and TAS. Be aware of this effect especially when flying at high altitude at high speeds, not to exceed VNE unawaresly. Bear in mind this can happen even with the indicator still pointing within the yellow arc!

VNE at altitude (standard ICAO atmosphere)

The tables below indicate IAS to TAS relation for an altitude span of 0 - 5000m (0 - FL165) in different atmospheres (variable is temperature). TAS is a constant of 225 km/h (122 kts) - VNE for the entire tables.

ISA-20 (-5°C at sea level):

Altitude (meters)	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Altitude (flight level)	0	FL16	FL33	FL50	FL66	FL82	FL98	FL115	FL131	FL148	FL165
VNE IAS (km/h)	225	225	223	218	213	209	203	198	194	189	185
VNE IAS (kts)	122	122	120	118	115	113	110	107	105	102	100

ISA-10 (5°C at sea level):

Altitude (meters)	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Altitude (flight level)	0	FL16	FL33	FL50	FL66	FL82	FL98	FL115	FL131	FL148	FL165
VNE IAS (km/h)	225	224	219	214	209	205	199	195	191	186	182
VNE IAS (kts)	122	121	118	116	113	111	108	105	103	100	98

ISA (15°C at sea level):

Altitude (meters)	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Altitude (flight level)	0	FL16	FL33	FL50	FL66	FL82	FL98	FL115	FL131	FL148	FL165
VNE IAS (km/h)	225	220	215	210	205	201	196	191	187	182	178
VNE IAS (kts)	122	119	116	113	111	109	106	103	101	98	96

ISA+10 (25°C at sea level):

Altitude (meters)	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Altitude (flight level)	0	FL16	FL33	FL50	FL66	FL82	FL98	FL115	FL131	FL148	FL165
VNE IAS (km/h)	220	215	211	206	202	197	192	188	184	179	175
VNE IAS (kts)	119	116	114	111	109	106	104	102	99	97	94

ISA+20 (35°C at sea level) :

Altitude (meters)	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Altitude (flight level)	0	FL16	FL33	FL50	FL66	FL82	FL98	FL115	FL131	FL148	FL165
VNE IAS (km/h)	216	211	207	202	197	193	189	184	180	175	171
VNE IAS (kts)	117	114	112	109	106	104	102	99	97	94	92

Note how VNE decreases at higher altitudes!

WARNING! RESPECT THE LISTED VALUES AT ALL TIMES, NOT TO EXCEED FLUTTER CRITICAL SPEED.

Engine, fuel, oil

Engine manufacturer: ROTAX

Engine types: ROTAX 503

The engine is not certified for aviation use therefore there is no assurance it cannot fail in its operation at any given moment, without prior notice to the user.

The engine

TEMPERATURE °C / ROTAX ENGINE	503 UL
cylinder head temp. (CHT); min., work, highest	100; 200; 250
max. CHT difference	20
exhaust gas temp. (EGT); normal, max.	460-580; 650
max. EGT difference	25
air intake temp. (AIR); highest	40
cooling fluids temp. (WATER); min., highest	/
oils temp. (OIL TEMP); min., normal, highest	/
RPM, PRESSURE	503 UL
oil pressure (OIL PRESS); lowest, highest	/
engine revolutions (RPM); on ground recom.	6400
RPM on ground; max. allowable	6800
magneto check at (RPM)	3500
max. single magneto drop (RPM)	200

Fuel and oil

ROTAX ENGINE	503 UL
recommended fuel	leaded or unleaded super
fuel to be discouraged from using	everything under AKI 87
recommended oil	super 2-stroke API-TC

IMPORTANT!

Two-stroke engines should be powered only by fuel complying with MON 83 (or higher) or RON 90 (or higher) classification. As for mixing fuel and oil manually, it is best to use recommended oil (see above). Dedicated lead additives should not be used (see detailed instructions in the engine manual).

MIXING RATIO: 50 UNITS of FUEL and 1 UNIT of OIL (e.g. 2 dl of oil every 10 litres of fuel)

Provided you are unable to use unleaded fuel on a regular basis, make sure the engine parts (pistons, cylinder heads) are decarbonised more often.

Propeller

TAURUS	Model 503
fixed pitch (wooden or composite)	1600mm

Engine instrument markings

WARNING! USER IS TO FILL IN ENGINE SPECIFIC VALUES.

Instrument	Red line (minimum)	Green arc (normal)	Yellow arc (caution)	Red line (maximum)
Tachometer (RPM)				
Cylinder head temp.				
Fuel quantity				

Weight limits

Taurus ultralight motorglider basic model weights

WEIGHT	Model 503
empty aircraft weight (excl. parachute rescue system)	285 kg
max. takeoff weight (MTOW/MTOM)	472.5 kg
fuel capacity	1 x 30 l (option 2 x 30 l)
max. fuel weight allowable	22.8 kg (option 45.6 kg)
minimum combined cockpit crew weight (depends on C.G. of empty aircraft)	see p. 53
maximum combined cockpit crew weight (depends on C.G. of empty aircraft)	see p. 53
water ballance reservoir (max weight)	9 kg
allowable luggage weight	10 kg

WARNING! SHOULD ONE OF THE ABOVE-LISTED VALUES BE EXCEEDED, OTHERS MUST BE REDUCED IN ORDER TO KEEP MTOM BELOW 450 / 472,5 KG. MAKE SURE MAXIMUM AND MINIMUM COCKPIT CREW WEIGHT AS WELL AS AVAILABLE LUGGAGE WEIGHT ARE ALWAYS KEPT WITHIN ALLOWABLE LIMITS. FAILING TO COMPLY WITH ANY OF THE WEIGHT LIMITATIONS MAY RESULT IN AIRCRAFT BEING UNCONTROLLABLE ON GROUND AND/OR IN FLIGHT DUE TO EXTREME CENTRE OF GRAVITY POSITION.

WARNING! CHECK THE WATER BALANCE RESERVOIR IN FRONT-CABIN AND VERIFY CREW'S WEIGHT BEFORE EVERY FLIGHT AS IT MAY INFLUENCE THE CENTRE OF GRAVITY OF AIRCRAFT TO THE POINT WHERE IT IS NO LONGER CONTROLLABLE!

Centre of gravity limits

- Aircraft's safe centre of gravity position ranges between 20% and 45% of MAC (Mean Aerodynamic Chord)
- C.G. point ranges between 203 mm and 420 mm, datum is wing's leading edge at wing root.

Manoeuvre limits

Taurus ultralight motorglider is certified as an Ultralight aircraft. Therefore, no aerobatic manoeuvres are permitted.

WARNING! FLYING IN CONSIDERABLE SIDE-SLIP WHEN THE ENGINE IS EXTENDED AND RUNNING MAY DAMAGE THE ENGINE-PROPELLER ASSEMBLY. YOU ARE STRONGLY DISCOURAGED FROM SIDE-SLIPPING WHEN ENGINE IS EXTENDED AND RUNNING!

G-load factors

- max. positive wing load: + 5.3 G
- max. negative wing load: – 2.65 G

Cockpit crew

- Actual minimum and maximum combined cockpit crew weight heavily depend on the centre of gravity of an empty aircraft. Minimum and maximum combined cockpit crew weight is determined after weighing the aircraft each time. Single occupant lever arm is 480 mm, double occupant lever arm is 535 mm. Formulas for the determination of minimum and maximum combined cockpit crew weight can be found on page 48 of this manual. Inside the cockpit, there must be a clearly visible placard stating the minimum and maximum combined weight of the crew.
- Maximum takeoff weight (MTOW) MUST NOT, under any circumstances, exceed 472.5 kg.

Types of operations

Taurus ultralight motorglider is built to fly under day visual flight rules (day VFR). Flight into known icing conditions is prohibited.

WARNING! SHOULD YOU FIND WATER DROPS ON THE AIRFRAME DURING PREFLIGHT CHECK-UP AT TEMPERATURES CLOSE TO FREEZING, YOU MAY EXPECT ICING TO APPEAR IN FLIGHT. AIRBRAKES ARE ESPECIALLY PRONE TO ICING UNDER SUCH CIRCUMSTANCES. AS WATER MAY ACCUMULATE UNDERNEATH THE TOP PLATE(S), SPOILERS MAY FREEZE TO THE WING SURFACE. SHOULD THIS OCCUR, YOU WILL MOST DEFINITELY BE UNABLE TO EXTEND SPOILERS BEFORE THE ICE MELTS. THEREFORE, FLYING UNDER CIRCUMSTANCES MENTIONED ABOVE, IT IS RECOMMENDED TO EXTEND AND RETRACT THE SPOILERS IN FLIGHT FREQUENTLY TO PREVENT ITS SURFACE FREEZING TO THE AIRFRAME.

Minimum equipment list

- Airspeed indicator
- Altimeter
- Compass
- Ibis II engine control instrument
- Parachute rescue system

Other restrictions

Due to flight safety reasons it is forbidden to:

- fly in heavy rainfalls;
- fly during thunderstorm activity;
- fly in a blizzard;
- fly according to instrumental flight rules (IFR) or attempt to fly in zero visibility conditions (IMC);
- fly when outside air temperature (OAT) reaches 40°C or higher;
- perform any form of aerobatic flying;
- take off and land with flaps retracted or set to negative (-5°) position;
- take off with spoilers extended.

Warning placards

Taurus ultralight motorglider is categorised as an Ultralight aircraft and must wear a warning placard as such. The placard indicates the aircraft is not certified according to EASA standards and is therefore flown completely at pilot's own risk.



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Emergency procedures



Introduction

Stall recovery

Spin recovery

Engine failure

Landing out

Engine fire

Smoke in cockpit

Carburetor icing

Flutter

Exceeding VNE

Parachute rescue system

Introduction

This chapter provides information on how to react when confronted with typical flight hazards.

Stall recovery

First reduce angle of attack by easing-off on the control stick, then

1. **If the engine is running, add full power (throttle lever in full forward position).**
2. **Resume horizontal flight.**

Spin recovery

Taurus ultralight motorglider is constructed in such manner that it is difficult to be flown into a spin. However, once spinning, intentionally or unintentionally, react as follows:

1. **If the engine is running, set throttle to idle (lever in full back position).**
2. **Apply full rudder deflection in the direction opposite the spin.**
3. **Lower the nose towards the ground to build speed (stick forward).**
4. **As the aircraft stops spinning neutralise rudder deflection.**
5. **Slowly pull up and regain horizontal flight.**

Taurus ultralight motorglider tends re-establish rightened flight by itself usually after having spinned for a mere 90°.

WARNING! KEEP THE CONTROL STICK CENTRED ALONG ITS LATERAL AXIS (NO AILERON DEFLECTIONS THROUGHOUT THE RECOVERY PHASE! DO NOT ATTEMPT TO STOP THE AIRCRAFT FROM SPINNING USING AILERONS INSTEAD OF RUDDER!

WARNING! AFTER HAVING STOPPED SPINNING, RECOVERING FROM THE DIVE MUST BE PERFORMED USING GENTLE STICK MOVEMENTS (PULL), RATHER THAN OVERSTRESSING THE AIRCRAFT. HOWEVER, VNE MUST NOT BE EXCEEDED DURING THIS MANOEUVRE.

When the aircraft is rightened and flies horizontally resume normal flight.

Engine failure

Engine failure during takeoff or initial climb

Ensure proper airspeed by reducing angle of attack and land the aircraft in runway heading, avoiding eventual obstacles in your way.

Set master switch to OFF position (key full left).

Land straight ahead.

WARNING! DO NOT CHANGE COURSE OR MAKE TURNS IF THIS IS NOT OF VITAL NECESSITY! AFTER HAVING LANDED SAFELY, ENSURE PROTECTION OF AIRCRAFT AND VACATE THE RUNWAY AS SOON AS POSSIBLE TO KEEP THE RUNWAY CLEAR FOR ARRIVING AND DEPARTING TRAFFIC.

Engine failure in climb

First ensure proper airspeed by reducing angle of attack, then start analysing terrain underneath and choose in your opinion the most appropriate site for landing out.

WARNING! THE DECISION WHERE TO LAND WHEN LANDING OUT IS FINAL! DO NOT CHANGE YOUR MIND EVEN IF YOU HAPPEN TO COME ACROSS A DIFFERENT, PERHAPS MORE APPROPRIATE LANDING SITE.

Provided the engine failed aloft, first retract the propulsion unit and prepare for an emergency landing if the conditions prevent you from gliding to the airport.

Emergency landing

Propulsion unit retracted

1. Master switch OFF (key in full left position).
2. Fasten your seat belts.
3. Approach and land with extreme caution, maintaining proper airspeed.
4. After having landed abandon the aircraft immediately.

Propulsion unit extended or refusing to retract

1. Attempt to retract the propulsion unit by setting the retraction switch up and back down IF your height is 300 m or higher. Otherwise, proceed with emergency landing.
2. Fasten your seat belts
3. Master switch OFF (key in full left position).
4. Should the propulsion unit remain extended or partially retracted land the aircraft onto the main wheels first in order to minimise vertical impact onto the propeller arm.

The landing out manoeuvre MUST be performed with regard to all normal flight parameters.

Engine fire

Engine fire on ground

This phenomenon is very rare in the field of Ultralight aviation. However, coming across engine fire on ground, react as follows:

1. Come to a complete standstill, master switch OFF immediately and throttle to full forward position.
2. Keep powerplant extended.
3. Abandon the aircraft and start fire extinguishing.

WARNING! AFTER THE FIRE HAS BEEN EXTINGUISHED DO NOT ATTEMPT TO RESTART THE ENGINE.

Engine fire in flight

1. **Set ignition OFF (Ibis II)**
2. **Set full power (throttle lever in full forward position).**
3. **Open slide windows and set all ventilation devices to ON.**
4. **Perform side-slip (crab) manoeuvre in direction opposite the fire.**
5. **Perform emergency landing out procedure and abandon the aircraft immediately**

Smoke in cockpit

Smoke in cockpit is usually a consequence of electrical wiring malfunction, since the engine compartment is fully enclosed and separated from the cockpit. As there is most definitely a short circuit somewhere it is required from the pilot to react as follows:

1. **Leave the engine extended and set master switch to OFF.**
2. **Close slide windows and set all ventilation devices to OFF.**
3. **Land as soon as possible.**

Electrical system failure

With the engine retracted: Continue flying as a sailplane.

With the engine extended and not running: Look for a landing field to do a safe outlanding.

With the engine extended and running: Do not stop the engine. Fly to the next airfield and land.

The fuel pump and the coolant pump will receive electric power directly from the generator to allow engine operation without battery power. Avoid longer sinking flights with the engine idling as lubrication of the engine will be insufficient. Therefore stop the engine for the landing or apply some throttle at least every 60 seconds to supply oil to the engine. Landing with the engine extended see previous page.

Landing gear failure

Should the landing gear fail to lower, fasten your seatbelts tightly and perform a landing procedure as normal. Use full flaps to have the minimum possible speed at touch-down. Flare at the same altitude like you would normally and in the same manner. Avoid eventual obstacles (bumps, fences etc. on the runway or strip where you're landing.

Carburetor icing

First noticeable signs of carburetor icing are loud engine noises and gradual loss of power.

Carburetor icing may occur even at temperatures as high as 10°C, provided the air humidity is increased.

Running the engine at full power under cloud base, where humidity is increased may lead to carburetor icing even in the summer. Be aware that the engine will not provide 100% power in that case and plan your flying accordingly.

**Should you be suspecting carburetor icing to take place, descent immediately!
In case of complete power loss perform emergency landing out procedure.**

Flutter

The flutter is defined as the oscillation of control surfaces. It is most cases caused by abrupt control deflections at speeds close or in excess of VNE. As it occurs, the ailerons, elevator or even the whole aircraft start to vibrate violently.

Should flutter occur, pull on the stick (and reduce power immediately)!

WARNING! FLUTTERING OF AILERONS OR TAIL SURFACES MAY CAUSE PERMANENT STRUCTURAL DAMAGE AND/OR INABILITY TO CONTROL THE AIRCRAFT. AFTER HAVING LANDED SAFELY, THE AIRCRAFT MUST UNDERGO A SERIES OF CHECK-UPS PERFORMED BY AUTHORISED SERVICE PERSONNEL TO VERIFY AIRWORTHINESS.

Exceeding VNE

Should the VNE be exceeded, reduce airspeed slowly and continue flying using gentle control deflections. Land safely as soon as possible and have the aircraft verified for airworthiness by authorised service personnel.

Parachute rescue system

System description

The GRS rocket charged parachute rescue system provides you with a chance to rescue yourself and the aircraft regardless of the height, velocity and nose attitude.

The system is mounted in the middle of the baggage compartment. The parachute is stored inside a deployment bag with a rocket engine next to it.

Its brand new design presents a canopy that is not gradually frown from the container, exposed to distortion by air currents, but it is safely open after 0,4 to 0,7 seconds in distance of 15-18 metres above the aircraft. It is fired there in a special deployment bag, which decreases the risk of aircraft debris breaching the canopy.

The parachute rescue system is activated manually, by pulling the activation handle mounted on the back wall above. After being fired, the man canopy is open and fully inflated within 3,2 seconds.

WARNING! ACTIVATION HANDLE SAFETY PIN SHOULD BE INSERTED WHEN THE AIRCRAFT IS PARKED OR HANGARED TO PREVENT ACCIDENTAL DEPLOYMENT. HOWEVER, THE INSTANT PILOT BOARDS THE AIRCRAFT, SAFETY PIN MUST BE REMOVED!

Use of parachute rescue system

In situations such as:

- structural failure
- mid-air collision
- loss of control over aircraft
- engine failure over hostile terrain

- pilot incapacitation (incl. heart attack, stroke, temp. blindness, disorientation...)

the parachute MUST be deployed.

Prior to firing the system:

- shut down the engine and set master switch to OFF (key in full left position)
- shut both fuel valves
- fasten safety harnesses tightly
- protect your face and body.

To deploy the parachute jerk the activation handle (placed above and between pilots) hard a length of at least 30 cm towards the instrument panel.

Once you have pulled the handle and the rocket is deployed, it will be less than two seconds before you feel the impact produced by two forces. The first force is produced by stretching of all the system. The force follows after the inflation of the canopy from opening impact and it will seem to you that the aircraft is pulled backwards briefly. The airspeed is reduced instantly and the aircraft now starts to descend to the ground underneath the parachute.

As a pilot you should know that the phase following parachute deployment may be a great unknown and a great adventure for the crew. You will be getting into a situation for the first time, where a proper landing and the determination of the landing site are out of your control.

CAUTION! SHOULD YOU END UP IN POWER LINES (CARRYING ELECTRICAL CURRENT), DO NOT UNDER ANY CIRCUMSTANCES TOUCH ANY METAL PARTS INSIDE OR OUTSIDE THE COCKPIT. THIS ALSO APPLIES TO ANYONE ATTEMPTING TO HELP OR RESCUE YOU. BE AWARE THAT ANYONE TOUCHING A METAL PART WHILE STANDING ON THE GROUND WILL PROBABLY SUFFER MAJOR INJURY OR DIE OF ELECTROCUTION. THEREFORE, YOU ARE STRONGLY ENCOURAGED TO CONFINE YOUR MOVEMENTS UNTIL QUALIFIED PERSONNEL ARRIVES AT THE SITE TO ASSIST YOU.

After the parachute rescue system has been used or if you suspect any possible damage to the system, do not hesitate and immediately contact the manufacturer!

Handling and maintenance of Parachute rescue system

Prior to every flight all visible parts of the system must be checked for proper condition. Special attention should be paid to eventual corrosion on the activation handle inside the cockpit. Also, main fastening straps on the inside of the fuselage must be undamaged at all times.

Furthermore, neither the system, nor any of its parts should be exposed to moisture, vibration and UV radiation for long periods of time to ensure proper system operation and life.

CAUTION! IT IS STRONGLY RECOMMENDED TO THOROUGHLY INSPECT AND GREASE THE ACTIVATION HANDLE, PREFERABLY USING SILICON OIL SPRAY, EVERY 50 FLIGHT HOURS.

All major repairs and damage repairs MUST be done by the manufacturer or authorised service personnel.

For all details concerning the GRS rescue system, please see the "GRS - Galaxy Rescue System Manual for Assembly and Use".

Normal procedures



Introduction

**Assembling and
disassembling the
aircraft**

Daily check-up

Preflight check-up

**Normal procedures and
recommended speeds**

Introduction

This chapter provides information on everything needed to fly Taurus ultralight motorglider safely.

Assembling and disassembling the aircraft

CAUTION! PRIOR TO EACH ASSEMBLING OR DISASSEMBLING ACTION TAURUS ULTALIGHT MOTORGLIDER SHOULD NOT BE PLACED UNDER STRONG SUNSHINE, AS COMPOSITE PARTS EXPAND AND CONTRACT. UNDER NO CIRCUMSTANCES ATTEMPT TO ASSEMBLE OR DISASSEMBLE ANY PARTS OF THE AIRCRAFT FORCEFULLY!

Assembling the wings

Three people (or two with a stand) are needed to assemble the wings to the fuselage.

First block all three wheels for the fuselage to stay in position.

Clean and grease the main wing pins and insertion openings. Open the canopy. Inside the cockpit set the flap handle to neutral position and unlock the spoilers' handle. Make sure you have all bolts, nuts, washers and spanners needed at a reach of a hand.

Lift one wing-half (one person at each end) and bring it closer to the fuselage. While the two are holding the wing-half high up, the third person directs their movement to put the wing's main spar into the opening on the adjacent side of the fuselage.

Now push the wing-half into its final position slowly. The person closest to the fuselage must make sure the spoiler and flap connectors have fitted into adequate fuselage fittings properly. At the same time, the person holding the wingtip must start with slight circular movements (1cm each direction) in order to assure a tight fit of the wing and its adequate bushings.

As this is done the person at the wingtip must remain in position holding the wing, whereas the other two move over to the other wing-half, lift it and bring it closer to the fuselage. Do not forget to make sure the spoiler and flap connectors have fitted into adequate fittings properly on this wing-half as well.

Both wing-halves should now be in their final position but still being held at wingtips. The person not holding the wings must now insert

both pre-greased spar pins. First insert the pin on the right-hand side of the cockpit because of easier insertion (thinner spar in front), then the pin on the left-hand side of the cockpit. If necessary, the two at the wingtips can assist by rocking the wings a couple of millimeters up and down.

Only when both spar pins have been inserted and secured, wingtips may be released. Now check all control deflections as well as flap and spoilers' extensions for smooth, unobstructed movement.

Insert all bolts and pins and secure them with self-locking nuts. Do not forget to put aluminium washers underneath the nuts! Connect all electrical cables and fuel hoses to their correct fittings.

Finally tape the gap between the fuselage and the wing using self-adhesive tape.

Disassembling the wings

Three people again are needed to disassemble the wings.

First block all three wheels for the fuselage to stay in position. Empty the fuel tank by pumping out fuel with the provided external fuel pump. Place the suction end of the pump through the filler neck inside the reservoir.

While you wait for the tanks to empty, disassemble the horizontal tail surfaces, disconnect all eventual electrical cables, then unscrew and remove both pin bolts.

WARNING! Do not remove spar pins yet!

Once the fuel tanks are empty, disconnect the fuel hoses inside the cockpit as well.

Make sure you tape the end attached to the wing not to spill any eventual leftover fuel over the fuselage or glass surfaces as substantial damage may occur.

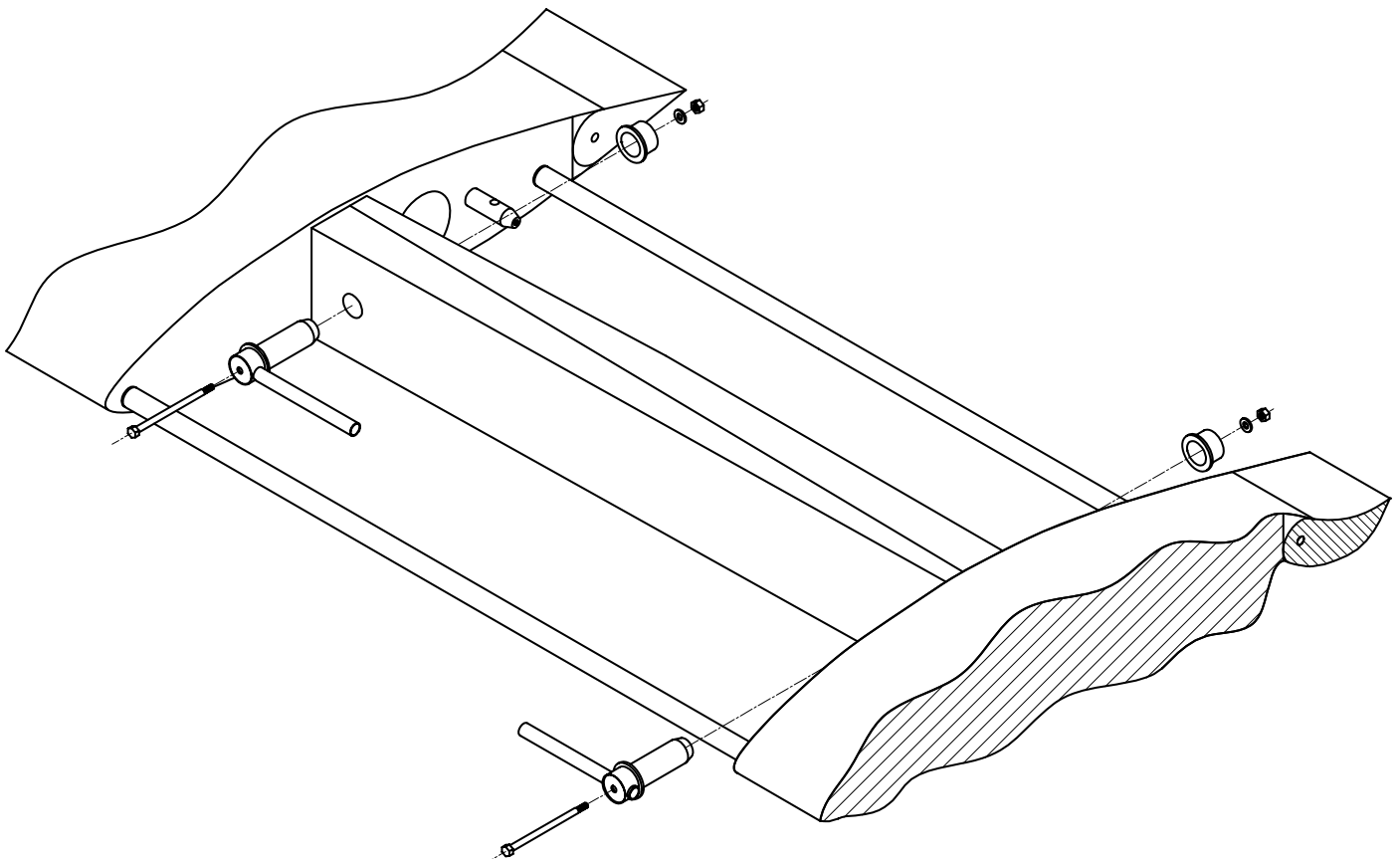
Two people must now lift the wingtips (one wingtip each) and the person in the cockpit remove the main spar pins, one by one, smoothly.

Forcing pins out of their position may result in structural damage, therefore the wingtip holders must hold the wing-halves precisely at certain height!

Using slight circular movement at the wingtip, the wing-halves must now be pulled out of the fuselage slowly. On pulling, each wing-half must be held by two, one at the wingtip and one near the spar.

As the wing-halves have been pulled out, place them onto a soft surface to prevent their damage.

Schematic of wing (dis)assembly



Fitting the horizontal tail surfaces

Horizontal stabilizer and elevator MUST be united during the following procedure. To fit the horizontal tail surfaces first set the trim handle inside the cockpit to full forward position. Make sure the pins, their holes and bushings have been cleaned and greased!

Lift the joint stabilizer and elevator and slide them into position by pushing them backwards. Now use the enclosed "T" key to push the security screw down while spinning it clockwise until the screw is completely tightened. Pull the "T" key out and make sure the safety pin holds the head of the screw, so that eventual unscrewing will not occur.

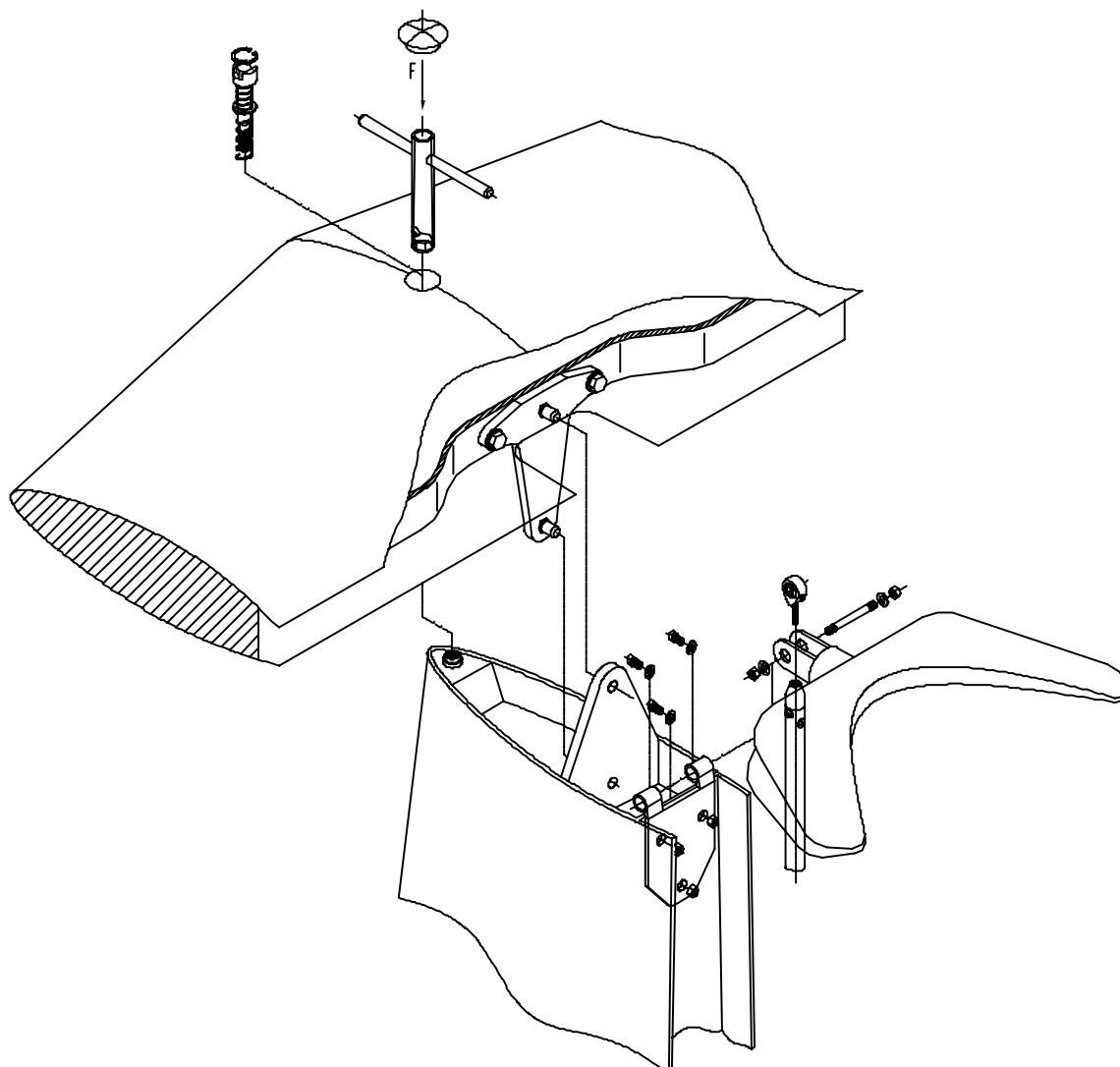
At the end tape the gap between horizontal and vertical tail surfaces and cover the hole on top of the vertical stabilizer with a sticker. Check control deflections for smooth, unobstructed movement.

Detaching the horizontal tail surfaces

Set the trim handle to full forward position and remove the safety sticker covering the hole on top of the horizontal stabilizer and the tape covering the gap between horizontal and vertical tail surfaces. Now use the enclosed "T" key to push the safety pin screw down while spinning it counter-clockwise until it is completely loose. To detach the horizontal tail unit push it forward using firm palm strokes until the unit pops out.

When detached, always place the horizontal tail unit onto a soft surface to prevent damage.

Schematic of horizontal tail surfaces (dis)assembly



Attaching the rudder

Bring the rudder close to fuselage and fit it first onto the top and then to the bottom hinge.

The rudder must then be fully deflected to one side to provide access to the rudder bolts. Use a self-securing, pre-glued M6 nut together with a washer and gently screw them onto the bolt using size 10 spanner. To reach the other rudder bolt deflect the rudder to the opposite direction and repeat the up-stated procedure.

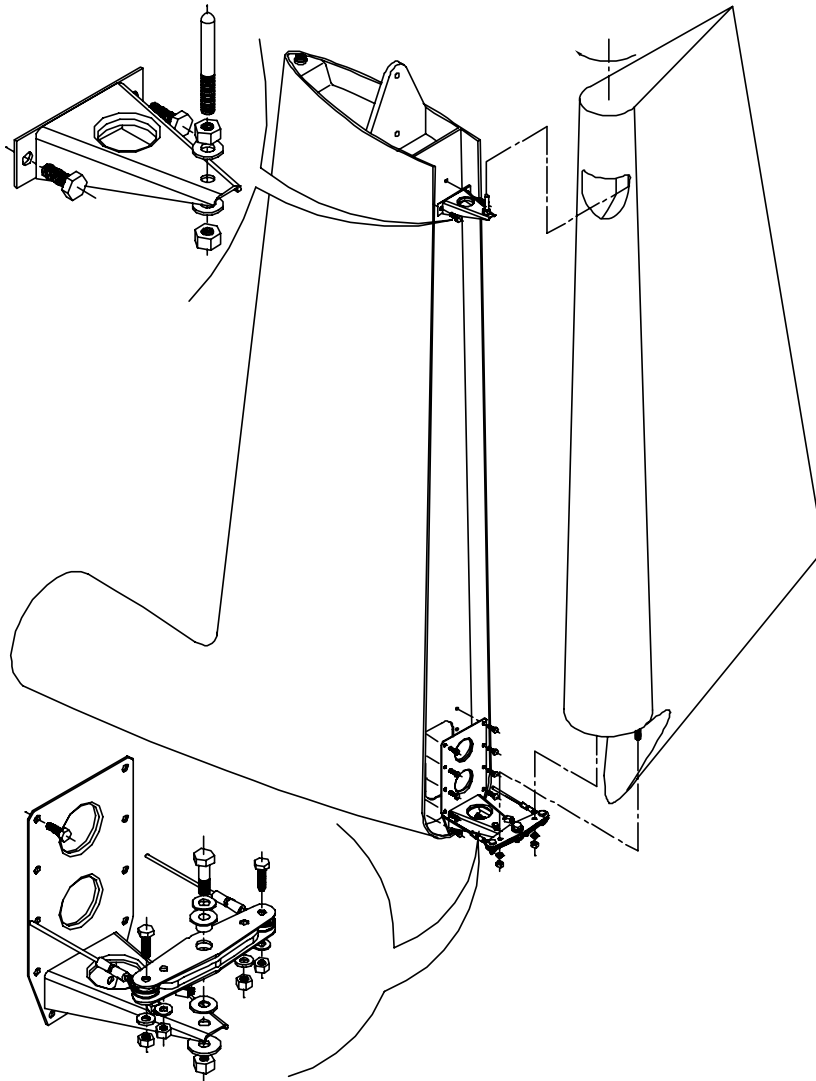
With both nuts tightened check full rudder deflections for smooth, unobstructed movement.

Detaching the rudder

Deflect the rudder to one side fully and unscrew the nut of the bolt with which the rudder is attached to the bottom hinge. This is the bolt located in-between the central bolt (axis of rotation) and the bolt holding the metal ropes. **DO NOT** touch these two bolts - unscrew the nut of the middle bolt **ONLY**. Now deflect the rudder to the opposite direction and repeat the up-stated procedure.

After both bolts have been unscrewed, lift the rudder and detach it first from the bottom, then from the top hinge.

Schematic of rudder (dis)assembly



Daily check-up

The daily check-up matches the preflight check-up.

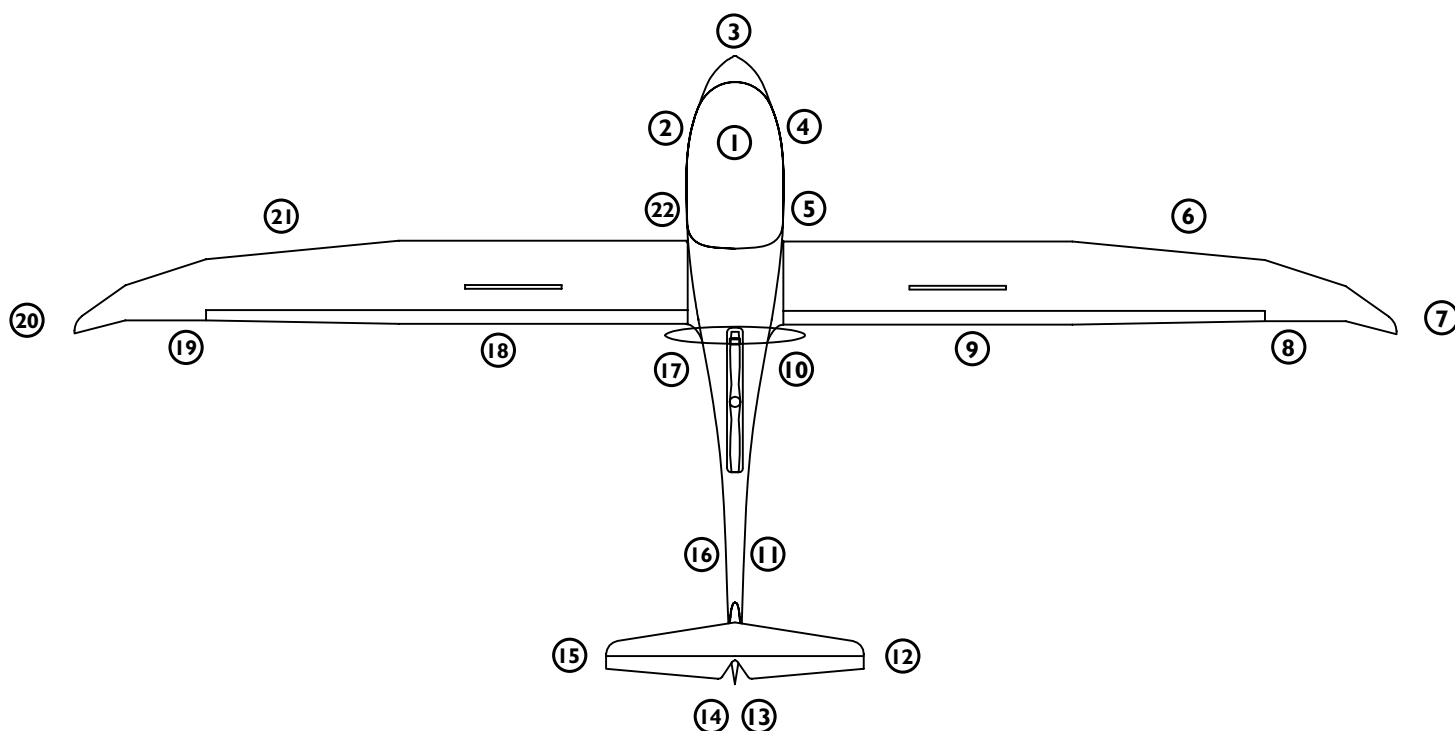
Preflight check-up

WARNING! EVERY SINGLE CHECK-UP MENTIONED IN THIS CHAPTER MUST BE PERFORMED PRIOR TO EVERY FLIGHT, REGARDLESS OF WHEN THE PREVIOUS FLIGHT TOOK PLACE!

THE PERSON RESPONSIBLE FOR THE PREFLIGHT CHECK-UP IS THE PILOT FROM WHOM IT IS REQUIRED TO PERFORM THE CHECK-UP IN THE UTMOST THOROUGH AND PRECISE MANNER.

PROVIDED THE STATUS OF ANY OF THE PARTS AND/OR OPERATIONS DOES NOT COMPLY WITH CONDITIONS STATED IN THIS CHAPTER, THE DAMAGE MUST BE REPAIRED PRIOR TO ENGINE START-UP. DISOBEYING THIS INSTRUCTIONS MAY RESULT IN SERIOUS FURTHER DAMAGE TO THE PLANE AND CREW, INCLUDING INJURY AND LOSS OF LIFE!

Schematic of preflight check-up



- | | | |
|-----------------------------|--------------------------------|--------------------------------|
| 1 Glass canopy | 8 Right wing - trailing edge | 15 Hor. tail surfaces (left) |
| 2 LH flank | 9 Right airbrake | 16 Fuselage, continued (left) |
| 3 Nose tip | 10 Engine, propeller (RH side) | 17 Engine, propeller (LH side) |
| 4 RH flank | 11 Fuselage, continued (right) | 18 Left spoiler |
| 5 Undercarriage, RH wheel | 12 Hor. tail surfaces (right) | 19 Left wing - trailing edge |
| 6 Right wing - leading edge | 13 Vert. tail surfaces (right) | 20 Left wingtip, lights |
| 7 Right wingtip | 14 Vert. tail surfaces (left) | 21 Left wing - leading edge |
| | | 22 Undercarriage, LH wheel |

Glass canopy ①

Surface condition: clear, no cracks, no wavy patterns, impact spots

Attachment fork: perfect closure, no deformations

De-fogging frame holes: clear for adequate airflow

Locking levers: check for correct and smooth operation, locking pin and bushing clean and greased

Water ballast reservoir: inserted and filled-up as required

LH flank ②

Surface condition: clear, no cracks, no wavy patterns, impact spots

Fuselage - canopy frame joint: equal spacing, perfect closure

Nose tip ③

Pitot tube: firmly attached, no mechanical damage or bendings. Remove protection cover and make sure it is not blocked or full of water.

Ventilation ring: firmly attached

Fuselage - canopy frame joint: equal spacing, perfect closure

RH flank ④

Surface condition: clear, no cracks, no wavy patterns, impact spots

Fuselage - canopy frame joint: equal spacing, perfect closure

Undercarriage, wheels ⑤ ②②

Bolts: fastened

Wheel: no mechanical damage (e.g. cracks), clean

Wheel axis and nut: fastened

Oil line (hydraulic brakes): no mechanical damage and/or leakage

Tyre: no cracks, adequate pressure

Wheel fairing: undamaged, firmly attached, clean (e.g. no mud or grass on the inside)

Wheel-bay doors: undamaged, check rubber-rope tension

Retraction mechanism: no visible abnormalities, adequate grease on sliding parts, clean of larger particles e.g. soil, dirt.

Gear bay: free of larger particles, soil, dirt etc.

Under-belly drain holes: make sure they are not blocked and clean accordingly.

Wings' leading edge ⑥ ②①

Surface condition: pristine, no cracks, impact spots, no paint and/or edge separations

Wing drain holes: make sure they are not blocked and clean accordingly.

Wingtip ⑦ ②①

Surface condition: pristine, no cracks, impact spots or bumps, no paint separations

Wings' trailing edge ⑧ ⑱

Surface condition: pristine, no cracks, impact spots, no paint and/or edge separations

Sealing tape between wing and aileron: undamaged and in position

Aileron: pristine surface, no cracks and/or impact spots, no paint abnormalities and edge separations, no vertical or horizontal free play, smooth and unobstructed deflections

Airbrakes, fuel reservoir cap ⑨ ⑱

Spoiler: firm, smooth, equal and unobstructed extension, tightly fitted when retracted, springs stiff and intact.

Fuel reservoir cap: fastened. Make sure the pipe is completely clean

Engine, propeller, rescue parachute hood ⑩ ⑰

Connection of the spindle drive to the engine for no cracks, abnormalities in aluminium plate, engine mount and bolts

Extend the powerplant completely.

Check all screwed connections and their securing.

Check function of throttle and propeller positioner.

Check ignition system including wires and spark plug connectors for tight fit.

Check engine retaining cable and its connection in the engine compartment at the engine.

Check fuel lines, electrical wires, bowden cables and structural parts for wear and kinks.

Check muffler, propeller mount for tight fit and cracking.

Apply strong pressure to the propeller mount in forward, backward and sideward directions to check if the bolted connection between engine block and propeller mount or anything else is loose or damaged. Check the rubber engine mounts also.

Check the propeller for no visual signs of abnormalities.

Turn the propeller one full revolution by hand and listen for abnormal sounds which may indicate engine damage.

Drain condensed water from the fuel tank. The drainer is located behind the seats, on the floor on port side of fuselage.

Parachute rescue system cover: intact and firmly in place. No deformations whatsoever.

Fuselage, continued ⑪ ⑱

Under-belly drain holes: make sure they are not blocked and clean accordingly

Vertical fin bottom part: no cracks, impact spots or paint separations along main chord

Surface condition: pristine, no cracks, impact spots or bumps, no paint and/or edge separations

Horizontal tail surfaces ⑫ ⑱

Surface condition: pristine, no cracks, impact spots or bumps, no paint and/or edge separations

Hinges: no free play in any direction

Central securing screw on top or the horizontal stabilizer: fastened and secured

Self-adhesive tape covering the gap between horizontal and vertical tail surfaces: in position

Elevator: smooth and unobstructed up-down movement, no side-to-side free play

Vertical tail surfaces ⑬ ⑱

Vertical fin bottom part: no cracks, impact spots or paint separations along main chord

Surface condition: pristine, no cracks, impact spots or bumps, no paint separations

Hinges: no free play in any direction

Rudder metal rope endings: intact, bolts in position

Tail wheel

Shock absorbing rubber: no cracks, firm and clean, check for no deformations

Tire: no cracks, adequate pressure

Wheel fork and fork base: nut tightened, no abnormalities, bearing in position

Lift the tail high enough so that the tail wheel is not touching the ground and make sure the wheel side-to-side deflections are smooth and unobstructed.

In-cockpit preflight check-up

Instrument panel and instruments: checked, **Fuses:** pushed in position

Master switch OFF (key in full left position): no control lights and/or electronic instrument activity

Master switch ON (key in full right position): control lights and electronic instrument active

Make sure you have set all instruments to correct initial setting.

Water ballast reservoir (front-cabin): check for water quantity and make sure it is appropriate for your planned flight. Remove or add water as necessary to keep the c.g. within limits.

WARNING! CHECK THE WATER BALANCE RESERVOIR IN FRONT-CABIN AND VERIFY CREW'S WEIGHT BEFORE EVERY FLIGHT AS IT MAY INFLUENCE THE CENTRE OF GRAVITY OF AIRCRAFT TO THE POINT WHERE IT IS NO LONGER CONTROLLABLE!

Main wing spars and connectors: no visible abnormalities of metal parts, spars, pins and bolts; all bolts and nuts in position and tightened

Fuel hoses and electrical cables: correctly connected and in position

Seat belts: undamaged, verify unobstructed harness opening; fastening points intact

Glass canopy: perfect closing at all points, smooth opening, hinges firmly attached; glass immaculately clean with no cracks.

Flap handle: button spring firm, locking mechanism working properly, smooth movement along full deflections, no free play or visible damage.

Spoilers (Airbrakes) handle: full forward and locked

Ventilation lever: as required

Radio wiring: test the switches, check connectors and headset, perform radio check

Battery: firmly in position, fittings clean with wires connected

Emergency parachute release handle: safety pin removed. Make sure unobstructed access is provided.

Normal procedures and recommended speeds

To enter the cabin first unlock the canopy frame and lift the glass canopy all the way by lifting the lock levers or lifting pads on each side of the cabin. Sit onto the cabin's edge and support your body by placing hands onto this same cabin edge and middle cockpit console. Drag yourself into the seat lifting first the inner and then the outer leg over the control stick. Immediately after having sat into the seat, check rudder pedals' position to suit your size and needs. Bring the pedals closer or further away by pulling the handle behind the control stick and slide them to the desired position.

To lower the canopy gently hold and pull the metal levers on the side of the cockpit. To lock the canopy once closed, push the levers forward so that they become parallel to the surface of the glass frame. Verify that the canopy is closed by applying upward-pressure to the canopy.

Fasten the safety harnesses according to your size.

WARNING! THE SAFETY HARNESS MUST HOLD YOU IN YOUR SEAT SECURELY. THIS IS ESPECIALLY IMPORTANT WHEN FLYING IN ROUGH AIR, AS OTHERWISE YOU MAY BUMP INTO THE CANOPY OVERHEAD.

Engine start-up

Before engine start-up

CAUTION! TO ENSURE PROPER AND SAFE USE OF AIRCRAFT IT IS ESSENTIAL FOR ONE TO FAMILIARISE WITH ENGINE'S LIMITATIONS AND ENGINE MANUFACTURER'S SAFETY WARNINGS. BEFORE ENGINE START-UP MAKE SURE THE AREA AROUND THE PROPELLER IS CLEAR. YOU CAN ALSO CHECK THIS IN THE INSTRUMENT PANEL MIRROR. IT IS RECOMMENDED TO START-UP THE ENGINE WITH AIRCRAFT'S NOSE POINTING AGAINST THE WIND.

Make sure the fuel quantity will suffice for the planned flight duration.
Make sure the pitot tube is not covered and rescue parachute safety pin removed.
Engage wheel brakes. Hold the control stick in full aft position always when on the ground.

CAUTION! SHOULD YOU NOT BE HOLDING THE CONTROL STICK IN FULL AFT POSITION, YOU MAY TIP THE NOSE OF THE AIRCRAFT AS THE CENTRE OF PROPULSION IS HIGH ABOVE THE FUSELAGE.

Engine start-up

Make sure the master switch is in ON position (key full right).
Extend the propulsion unit (Ibis II switch to UP position).
Set throttle 2 cm forward from idle position
After the propustion unit is extended (indication green), set ignition on (Ibis II ignition switch ON).
Engage engine starter and keep it engaged until the engine starts.
When the engine is running, set throttle to at most 3500 RPM.

CAUTION! DUE TO THE DESIGN OF THE POWERPLANT THE RPM MUST BE KEPT ABOVE 2700 AT ALL TIMES WHEN ON GROUND. SHOULD YOU LET THE RPM SINK BELOW 2500 THE ENGINE MAY SUFFICATE AND SHUT DOWN BY ITSELF.

Engine warm-up procedure

A two-stroke engine should be warmed-up at 3500 RPM at most, to the point working temperature is reached.

Warming-up the engine you should:

- 1 Point aircraft's nose against the wind.
- 2 Verify the engine temperature ranges within operational limits.

CAUTION! AVOID ENGINE WARM-UP AT IDLE THROTTLE AS THIS CAUSES SPARK PLUGS TO TURN DIRTY AND THE ENGINE TO OVERHEAT.

With wheel brakes engaged and control stick in full back position, first set engine power to 3500 RPM in order to perform the magneto check. Set the magneto switch on LEFT, then RIGHT and then back into the middle to verify RPM drop of not more than 250 RPM. When the magneto check has been completed, add full power (throttle lever full forward) while holding the stick in full aft position. Monitor engine's RPM. Make sure they range between maximum recommended and maximum allowable RPM limits.

CAUTION! SHOULD ENGINE'S RPM BE LOWER THAN MAX. RECOM. RPM ON GROUND OR IN EXCESS OF MAXIMUM ALLOWABLE RPM ON GROUND DURING THIS MANOEUVRE, CHECK ENGINE AND WIRING FOR CORRECT INSTALLATION.

Taxi

Taxiing technique does not differ from other taildragging aircrafts. Prior to taxiing it is essential to check wheel brakes for proper braking action.

In case you expect taxiing to last, take engine warm-up time into account and begin taxiing immediately after engine start-up. Warm-up the engine during taxiing not to cause engine overheating because of prolonged ground operation.

CAUTION! TAXI AT AT MOST 10KM/H / 5 KTS, AS THERE ARE NO DIFFERENTIAL BRAKES AVAILABLE. STEERING IS PROVIDED BY A STEARABLE TAIL WHEEL THROUGH RUDDER INPUT.

Holding point

Make sure the temperatures at full power range within operational limits.

Make sure the safety harnesses are fastened and canopy closed and secured at both sides.

Set flaps to T position.

Power idle.

CAUTION! SHOULD THE ENGINE START TO OVERHEAT BECAUSE OF LONG TAXI AND HOLDING, SHUT DOWN THE ENGINE AND WAIT FOR THE ENGINE TEMPERATURES DROP TO REASONABLE VALUES. IF POSSIBLE, POINT THE AIRCRAFT'S NOSE TOWARDS THE WIND. THIS WILL PROVIDE COOLING MEANS WITH AIRFLOW TO COOL DOWN THE ENGINE FASTER.

Take-off and initial climb

Before lining-up verify the following:

Spoilers: retracted and secured

Fuel quantity: sufficient

Safety belts: fastened

Cabin: closed securely

Trim handle: in neutral position or slightly backward

Flap handle: T position

Runway: clear

Now pull the stick to full aft position, line up and add full power.

Verify engine for sufficient RPM at full throttle.

CAUTION! KEEP ADDING POWER GRADUALLY.

WARNING! SHOULD ENGINE RPM NOT REACH SUFFICIENT RPM WHEN AT FULL THROTTLE, ABORT TAKE-OFF IMMEDIATELY, COME TO A STANDSTILL AND VERIFY THE PROPUSTION GROUP.

Start the takeoff roll pulling the elevator full aft, then slowly ease on the sitck the lift the tail wheel of the ground as you accelerate. Reaching Vr (between 70 -75 km/h; 38-42 kts), pull on the stick to get the aircraft airborne.

CAUTION! CROSSWIND (MAX 28 KM/H (15 KTS)) TAKEOFF SHOULD BE PERFORMED WITHAILERONS DEFLECTED OPPOSITE THE DIRECTION OF THE WIND. SPECIAL ATTENTION SHOULD BE PAID TO MAINTAINING RUNWAY HEADING AND NOT LOWERING THE WINGTIP TOO MUCH!

Initial climb

When airborne, accelerate at full power and later maintain proper speed of climb. As you reach 100 km/h (55kts) at a height above 50 meters (165 ft), retract flaps to neutral position, and retract the landing gear. Continue climbing with full power at 100 km/h.

Adjust the trim to neutralise the stick force if necessary.
Remember to keep the temperatures and RPM within operational limits during this manoeuvre.

CAUTION! REDUCE RPM AND INCREASE SPEED IN ORDER TO COOL THE ENGINE DOWN IF NECESSARY.

Reaching the desired altitude, establish reduce power and establish horizontal flight.

Level flight

Taurus ultralight motorglider is not designed to be a cruising aircraft, however you may be able to maintain level cruise flight should this be required. To cover distances, saw-tooth flight with interchanging full power climbs and glides are an established common practice. When saw-toothing, plan your flight well and always restart the engine over a landable terrain.

WARNING! CRUISING IN COMMON SENSE OF THE WORD IS NOT AN APPROVED PROCEDURE WITH TAURUS ULTRALIGHT MOTORGLIDER AND SHOULD BE USED ONLY IF THERE IS NO OTHER OPTION. SAW-TOOTHING IS, HOWEVER, APPROVED AND PUTS LESS STRESS TO THE AIRCRAFT AND ENGINE COMPONENTS.

WARNING! SHOULD YOU ATTEMPT LEVEL FLIGHT CRUISING, RESPECT THIS PARAGRAPH. THE CRUISING SPEED IS LIMITED BY THE WINDMILL EFFECT AND THUS EGT ENGINE VALUES. THESE AND THE CRUISE SPEED MAY VERY DEPENDING ON OUTSIDE AIR TEMPERATURE, ELEVATION AND THE HUMIDITY OF THE AIR. SHOULD EGT VALUES BE REACHING MAXIMUM ALLOWABLE LIMITS, REDUCE AIRSPEED IMMEDIATELY AND INITIATE CLIMB AT FULL THROTTLE. USE AIRBRAKES ACCORDINGLY TO MAINTAIN LEVEL ALTITUDE. THIS WILL COOL DOWN THE ENGINE.

WARNING! SHOULD YOU ATTEMPT LEVEL FLIGHT CRUISING, RESPECT THIS PARAGRAPH. DUE TO THE DESIGN OF THE POWERPLANT THERE MAY BE A REGION OF RPM IN LEVEL FLIGHT CRUISING, WHICH CAUSES INCREASED VIBRATION. THIS VIBRATION TRANSFERS FROM THE POWERPLANT TO THE REST OF THE AIRCRAFT (ELECTRONICS, AVIONICS, INSTRUMENTS, EQUIPMENT ETC.). THIS REGION OF SEVERE VIBRATION NORMALLY LIES SOMEWHERE BETWEEN 5000 - 6000 RPM AND MUST BE AVOIDED. YOU SHOULD NOT, UNDER ANY CIRCUMSTANCES, ATTEMPT TO DO LEVEL FLIGHT CRUISING WITH THE ABOVE MENTIONED VIBRATION OCCURRING. AS A PILOT, YOU SHOULD EITHER ADD OR REDUCE POWER, LOWER OR RAISE THE FLAPS TO AVOID RPM IN LEVEL FLIGHT CRUISING WHICH INVOKES VIBRATION.

Flights in rough atmosphere

Should you experience wake turbulence, reduce airspeed and continue flying with flaps set to neutral position.

CAUTION! IN ROUGH AIR EXTEND AIRBRAKES (UNPOWERED FLIGHT) FOR SHORT TIME IF NECESSARY TO KEEP AIRSPEED BELOW VRA.

Descent and final approach

With Taurus ultralight motorglider conduct the approach and landing like a glider - with the propulsion unit in its retracted (DOWN) position.

On downwind (150-200 m, 500-700 ft), maintain a speed of 100 km/h (55 kts) and lower and secure the gear. Before turning base, set the flaps to T stage, and reduce your speed to 90-95 km/h (48-51 kts). Set trim to neutralise stick force if necessary.

CAUTION! WHEN DESCENDING, MAKE SURE THE PROPULSION UNIT IS RETRACTED!

CAUTION! WITH FLAPS IN L POSITION ONLY HALF WAY AILERON DEFLECTIONS ARE PERMITTED.

On final, set flaps to L position only if the runway is very short and a steep angle of arrival is required. Align with the runway and extend airbrakes while maintaining an airspeed of 90-95 km/h (48-51 kts). Use airbrakes to control your approach glide path.

CAUTION! CROSSWIND LANDINGS REQUIRE HIGHER FINAL APPROACH SPEEDS TO ENSURE AIRCRAFT'S SAFE MANOEUVRABILITY.

Roundout and touchdown

CAUTION! See chapter "Performance" for landing performance.

Final roundout (flare) and touchdown should be performed at following airspeeds:

Calm air, aircraft at MTOM	75 km/h (40 kts) IAS
Rough air, aircraft at MTOM (incl. strong crosswinds up to 28 km/h (15 kts))	78 km/h (42 kts) IAS

CAUTION! LAND THE AIRCRAFT IN SUCH A MANNER THAT ALL THREE WHEELS TOUCH THE GROUND AT EXACTLY THE SAME TIME. WHEN TOUCHING DOWN, RUDDER MUST NOT BE DEFLECTED IN ANY DIRECTION (RUDDER PEDALS CENTRED).

When on ground, start braking action holding the control stick in full back position. Steer the aircraft by using rudder inputs. Provided the runway length is sufficient, come to a complete standstill without engaging the brakes to ensure their long life.

WARNING! AFTER TOUCHDOWN, DO NOT RETRACT SPOILERS IMMEDIATELY, AS THIS CAUSES SUDDEN LIFT INCREASE AND THE AIRCRAFT MAY REBOUND OFF THE GROUND. SHOULD THIS OCCUR, HOLD THE ELEVATOR STEADY; UNDER NO CIRCUMSTANCES ATTEMPT TO FOLLOW AIRCRAFT'S MOVEMENT WITH ELEVATOR DEFLECTIONS, SINCE TAURUS ULTRALIGHT MOTORGLIDER TENDS TO ATTENUATE REBOUNDING BY ITSELF. HOWEVER, IT IS IMPORTANT TO MAINTAIN RUNWAY HEADING USING THE RUDDER AT ALL TIMES. TO PREVENT THIS, RETRACT SPOILERS ONLY AFTER THE AIRCRAFT HAS COME TO A COMPLETE STANDSTILL.

WARNING! TOUCH AND GO-ES ARE NOT POSSIBLE!

Having reached a complete standstill, extend the engine (Engine start-up) and taxi (Taxi) off the runway.

Crosswind approach and roundout

CAUTION! CROSSWINDS PROLONG LANDING RUNWAY LENGTH (SEE CHAPTER "PERFORMANCE").

Performing a crosswind landing, the wing-low method should be used. When using the wing-low method it is necessary to gradually increase the deflection of the rudder and aileron to maintain the proper amount of drift correction.

WARNING! IF BY CHANCE THE CRAB METHOD OF DRIFT CORRECTION HAS BEEN USED THROUGHOUT THE FINAL APPROACH AND ROUNDOUT, THE CRAB MUST BE REMOVED THE INSTANT BEFORE TOUCHDOWN, BY APPLYING RUDDER TO ALIGN THE AIRCRAFT'S LONGITUDINAL AXIS WITH ITS DIRECTION OF MOVEMENT.

Parking

Come to a complete standstill by engaging brakes. Re-check RPM drop by switching magnetos OFF and back ON, one by one. Leave the engine running at idle RPM for a minute in order to cool it down. Set the ignition switch on Ibis II OFF, then the Master switch OFF. Unlock airbrakes (handle lifted slightly) and insert paracute rescue system handle's safety pin. Open the canopy, unfasten safety belts and exit the cockpit. Close and lock the canopy after you have left the aircraft. When closing the canopy, make sure that the lock-handles are in OPEN position not to damage the locking pins. Also, block the wheels if parking on a slope.

CAUTION! WHENEVER YOU LEAVE THE AIRCRAFT MAKE SURE THE CANNOPY IS CLOSED AND LOCKED. SHOULD YOU FORGET TO DO THIS THE CANNOPY FRAME MAY NOT FIT THE FUSELAGE FRAME ANY MORE WHEN YOU RETURN, SINCE THE STRETCH COEFFICIENT OF FIBRE GLASS AND PLEXI-GLASS ARE SIGNIFICANTLY DIFFERENT. ALSO, COVER THE CANNOPY WITH A FABRIC COVER, TO PREVENT THE CABIN FROM OVERHEATING (PROTECT TO INSTRUMENTS AND SYSTEMS).

Retracting & Extending propulsion unit in flight

This procedure applies only for retracting/extending the propulsion unit as an intentional event, be aware you may lose up to 100m (300ft) of altitude during this procedure.

If under power, set throttle to idle and ignition on first. Reduce speed to 80 km/h (43 kts) and set flaps to 1st stage. Continue decelerating towards 70 km/h (40 kts).

With master switch ON and ignition OFF select the desired propulsion unit position (UP or DOWN) on the Ibis II. The system will complete the retraction/extension by itself. For more details please consult Ibis II - engine control and monitoring instrument in chapter Aircraft and Systems on board in this manual.

To restart the engine in-flight follow the same procedure as for Engine startup (page 34) while maintaining level flight at 80 km/h (43 kts) with flaps in 1st stage.

WARNING! BEFORE YOU ACTIVATE THE STARTER, MAKE SURE THE PROPELLER IS IN A FULLY EXTENDED AND UPRIGHT POSITION (LEFT GREEN AND AMBER LIGHT INDICATION)!

Should the engine cool down during unpowered flight. Always start the engine with throttle 2 cm forward from idle position.

CAUTION! DO NOT ADD FULL POWER WHILE THE ENGINE IS STILL COLD. KEEP FLYING AT 80 KM/H (43 KTS) WITH FLAPS IN L STAGE AND NOT MORE THAN 3000 RPM TO WARM-UP THE ENGINE FIRST.

Performance



Introduction

**Airspeed indicator
calibration**

Take-off performance

Climb performance

Cruise

Descent

Landing performance

**Maneuver & gust
envelope**

Speed polar

Additional technical data

Noise levels

Introduction

This chapter provides information on aircraft's airspeed calibration, stall speeds and general performance. All data published was obtained from test flight analysis. Test pilots were instructed to control the plane simulating average pilot's flying skills.

Airspeed indicator calibration (IAS to CAS)

Pitot tube's ingenious mounting and construction makes IAS to CAS correction values insignificant. Therefore pilots should regard IAS to be same as CAS. $IAS = CAS$.

Stall speeds

Stall speeds at MTOM are as follows:

flaps in negative position; -5° (up):	75 km/h (40.5 kts)
flaps in neutral position; 0° (neutral):	71 km/h (38.3 kts)
flaps in 1 st position; $+5^\circ$ (down):	68 km/h (36.7 kts)
flaps in T position; $+9^\circ$ (down):	65 km/h (35.0 kts)
flaps in L position; $+18^\circ$ (down):	63 km/h (34,0 kts)

Take-off performance

All data published in this section was obtained under following conditions:

aircraft at MTOM

runway elevation: 100 meters (330 feet)

wind: calm

runway: dry grass runway with low-cut grass, no significant up- or downslope

ICAO standard atmosphere

Taurus	Model 503
takeoff runway length at MTOM	180 m (590 ft)
takeoff runway length (over 15m (50 ft) obstacle)	265 m (870 ft)

Note: in order to meet the data for takeoff runway length over 15 m obstacle maintain V_x after take-off.

Takeoff runway length may vary depending on the wind, temperature, elevation and wing & propeller surface condition.

Effect of elevation

The table below provides data about the effect of elevation on takeoff runway length.

elevation (m)	0	500	1000	1500
atmosph. pressure (hPa)	1012	954	898	845
outside temperature (°C)	15.0	11.7	8.5	5.2
Takeoff runway length [m (ft)]				
Model 503	180 (590)	205 (670)	252 (826)	295 (970)

WARNING: If the outside temperature is higher than the standard value it is mandatory to consider the takeoff runway length prolongs as follows: $L = 1,10 \cdot (L_h + L_t - L_0)$.

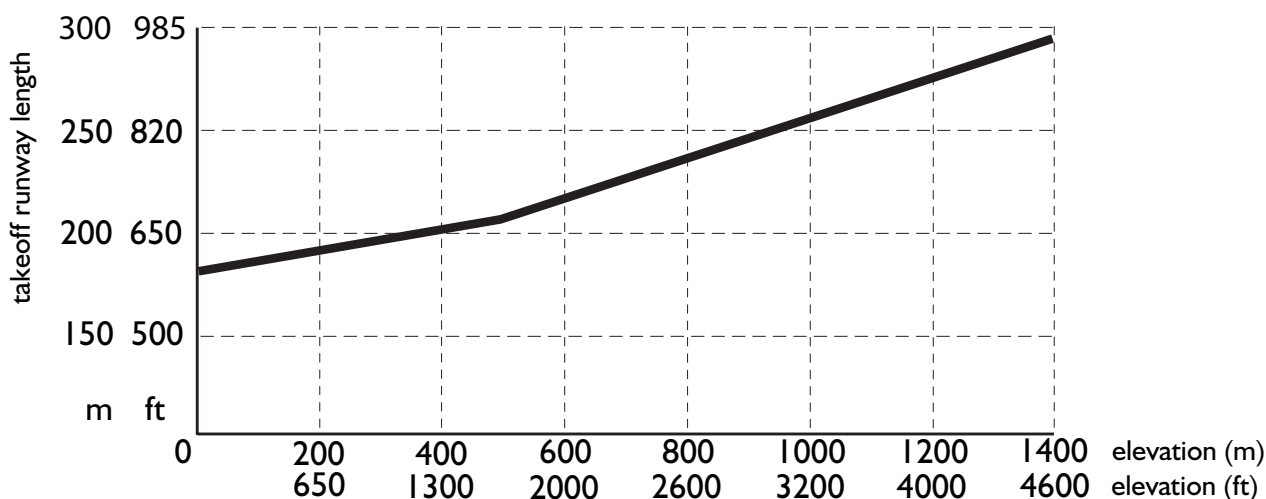
Abbreviations are as follows:

L_h = takeoff runway length at present elevation,

L_t = takeoff runway length at sea level at same atmospheric conditions,

L_0 = takeoff runway length at 15°C.

The graph below indicates how takeoff runway length changes as altitude increases.



Effect of the wind

Wind (head, cross or downwind - also called tailwind) affects aircraft's ground speed (GS).

Headwind on takeoff and landing causes the Takeoff and Landing runway length to shorten as the GS is smaller during these two flight stages. The opposite stands for tailwind on takeoff and landing as tailwind prolongs Takeoff and Landing runway length significantly.

The data on the next page was obtained through testing and therefore serve as informative values only.

Headwind shortens Takeoff and Landing runway length by 8 meters (25 feet) with every 5 km/h (3 kts) of wind increase (e.g. provided there is a 10 km/h (6 kts) headwind on takeoff and landing, distances will be approximately 16 meters (50 feet) shorter than ones published in the manual).

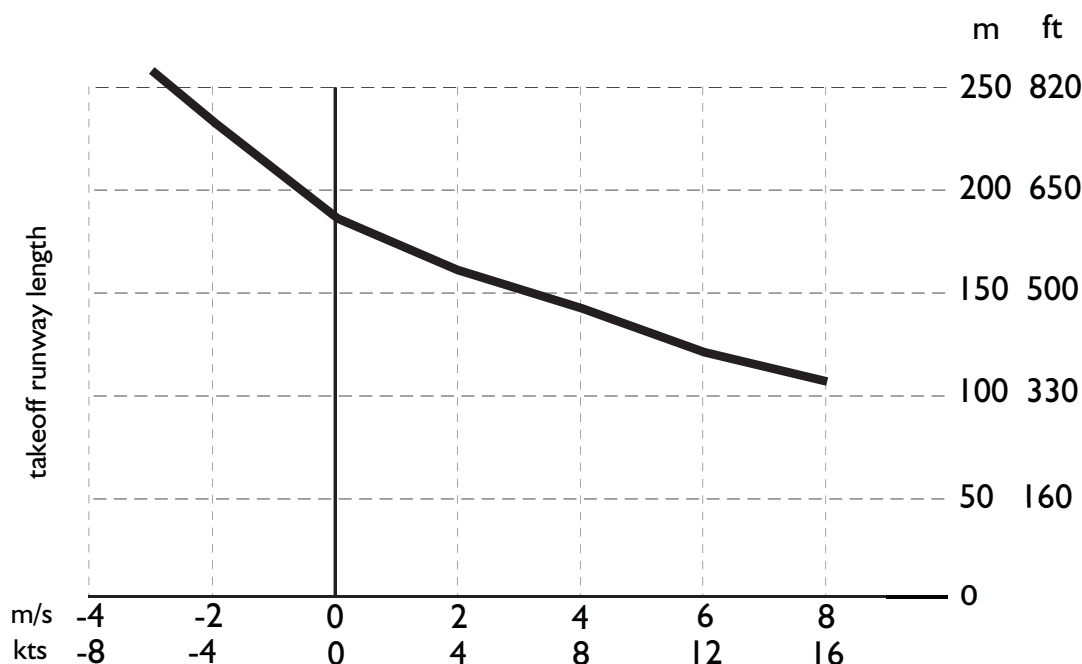
Tailwind prolongs Takeoff and Landing runway length by 18-20 meters (60-65 feet) with every 5 km/h (3kts) wind increase (e.g. provided there is a 10 km/h (6kts) tailwind on takeoff and landing, distances will be approximately 36-40 meters (120-130 feet) longer then ones published in the manual).
3x

WARNING! TAILWIND AFFECTS TAKEOFF AND LANDING PERFORMANCE BY MORE THAN TWICE AS MUCH AS HEADWIND DOES.

The table below provides data about the effect of headwind (+) and tailwind (-) on takeoff runway length.

windspeed (m/s)	-3	-2	-1	0	2	4	6
windspeed (kts)	-6	-4	-2	0	4	8	12
Takeoff runway length [m (ft)]							
Model 503	297 (975)	243 (800)	205 (670)	180 (590)	164 (537)	147 (480)	122 (400)

The graph below indicates how takeoff runway length changes when affected by wind.

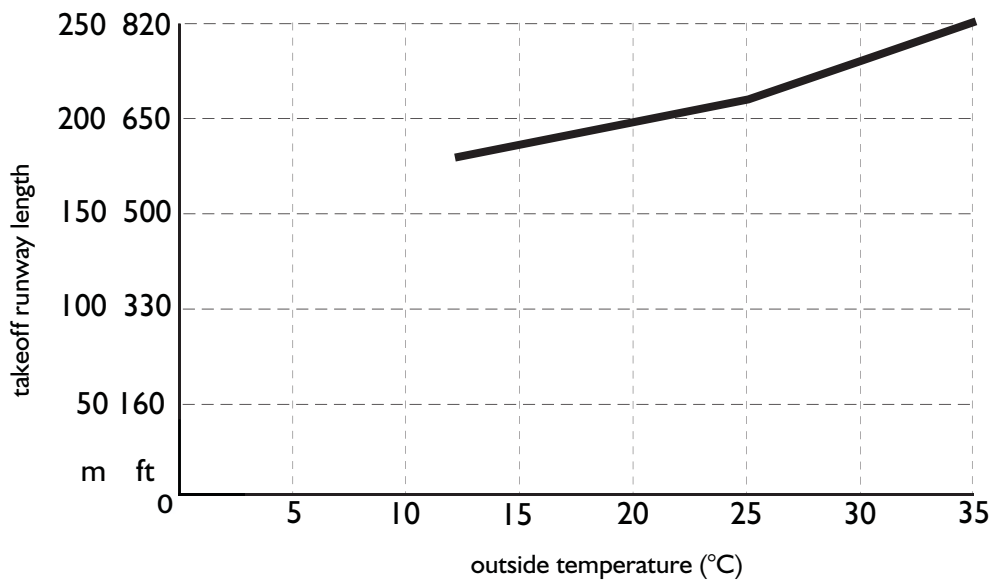


Effect of outside temperature

The table below provides data about the effect of outside temperature on takeoff runway length.

temperature (°C)	13	20	25	30	35
Takeoff runway length [m (ft)]					
Model 503	180 (590)	197 (645)	215 (705)	237 (780)	255 (836)

The graph below shows how takeoff runway length changes when affected by temperature changes.



Climb performance

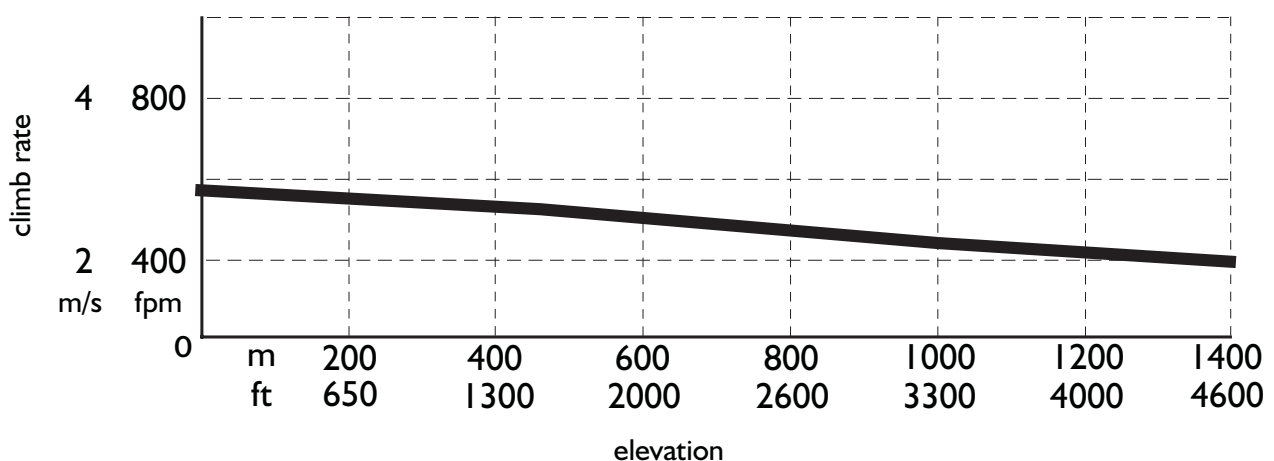
Taurus	Model 503
best climb speed V_y	100 km/h (54 kts)
best climb rate at MTOM	2.9 m/s (580 fpm)

Effect of elevation

The table below provides data about the effect of elevation on climb rate at best climb speed V_y .

Taurus	Model 503
0 m (0 ft)	2.9 m/s (580 fpm)
500 m (1600 ft)	2.6 m/s (520 fpm)
1000 m (3300 ft)	2.2 m/s (440 fpm)
1500 m (5000 ft)	2.0 m/s (400 fpm)

The graph below indicates how climb rate changes as altitude increases.



Descent

The rate of descent and by that descent glide path is adjusted using spoilers.
Typical sink rate, with flaps set to L position and spoilers fully extended, measures 4,5 m/s (900 fpm) at 90 km/h (48 kts) and 6,0 m/sec (1200 fpm) at 115 km/h (62 kts).

Taurus	Model 503
max. sink rate, spoilers extended, flaps L at flap speed limit	6.0 m/sec (1200 fpm)

Landing performance

PRECISE DATA WILL BE PUBLISHED AFTER DEDICATED TEST FLIGHTS! PRESENT DATA IS SUBJECT TO CHANGE WITHOUT NOTICE!!!

Landing runway length may vary depending on the elevation, gross weight, touchdown velocity, wind direction and how aggressive the braking action is. In following conditions: aircraft at MTOM, airport elevation 100 meters (300 feet), wind calm; the landing runway length measures 110 meters (330 feet). Should you be flying solo, the length shortens by another 10 meters (30 feet).

WARNING! RUNWAY PROPORTIONS MUST BE IN EXCESS OF 400 X 30 METERS (1300 X 100 FEET) WITH NO OBSTACLES IN 4° RANGE OFF RUNWAY HEADING IN ORDER ENSURE SAFE FLYING ACTIVITY. USE OF SHORTER STRIPS SHOULD BE CONSIDERED A MAJOR EXCEPTION AND IS ALLOWED TO EXPERIENCED PILOTS AT OWN RISK ONLY.

Crosswind landing limitations

Maximum allowed crosswind speed for landing with flaps in L position as well as take-off if with flaps in T position is 28 km/h (15 kts).

Gliding performance

The glide is defined as unpowered rightened flight at speed providing best lift over drag ratio or minimum sink rate.

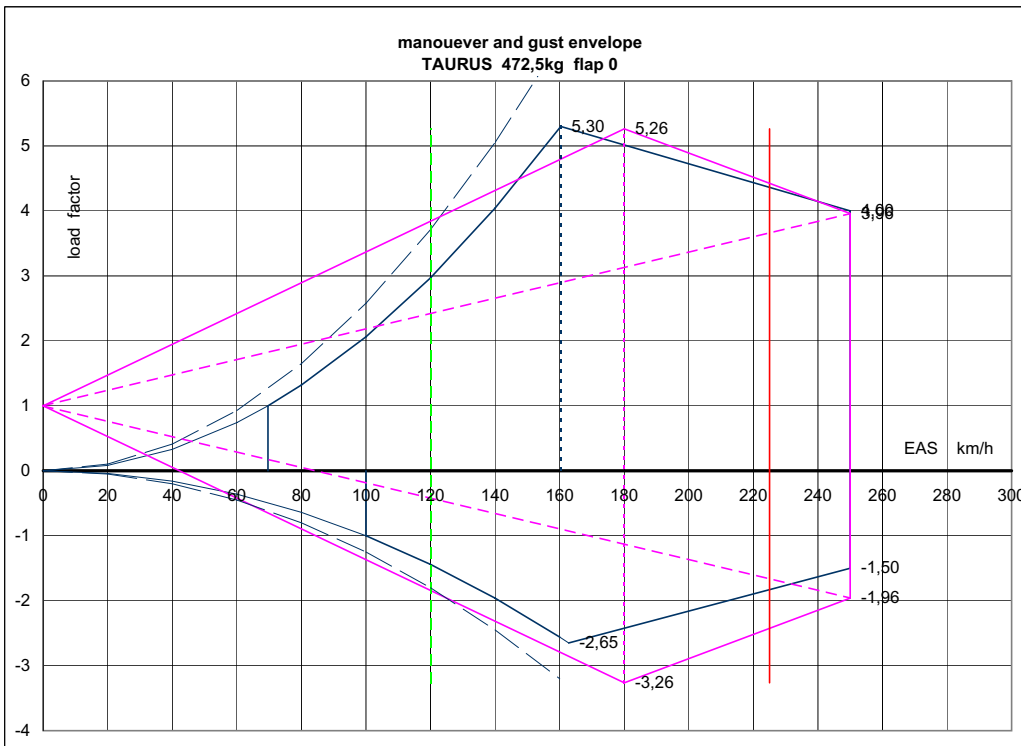
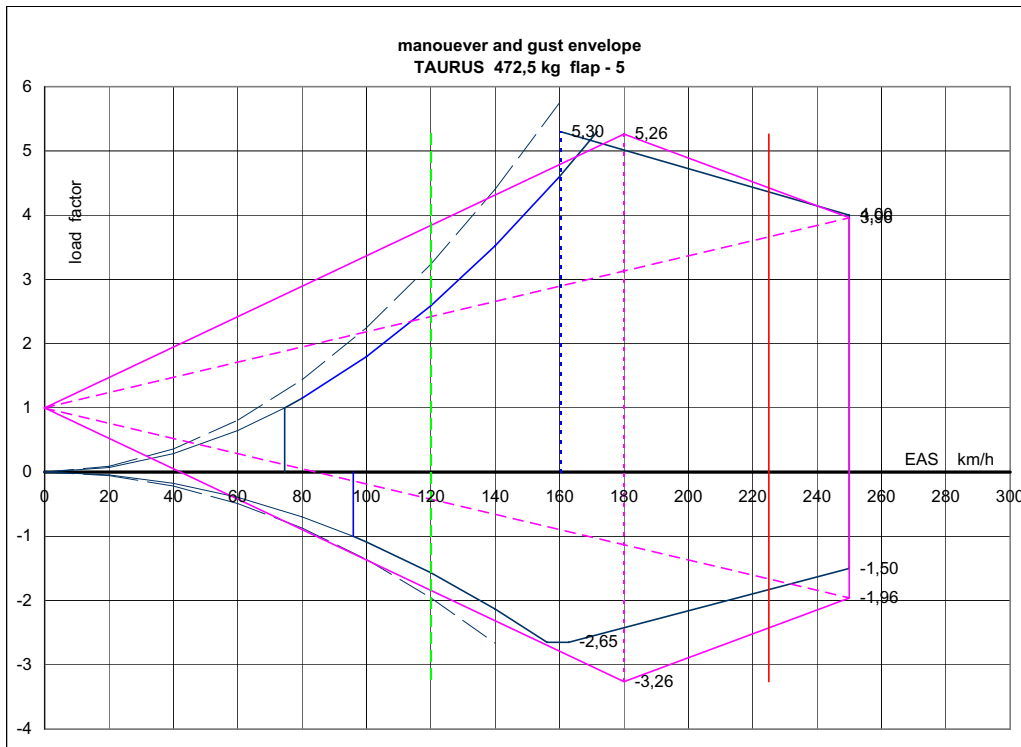
Should the engine become inoperative in flight, as a result of either intended or unintended action, and it cannot be restarted, react as follows:

establish rightened flight at the speed providing best lift over drag ratio, if you desire to overcome greatest distance at reach from initial altitude.

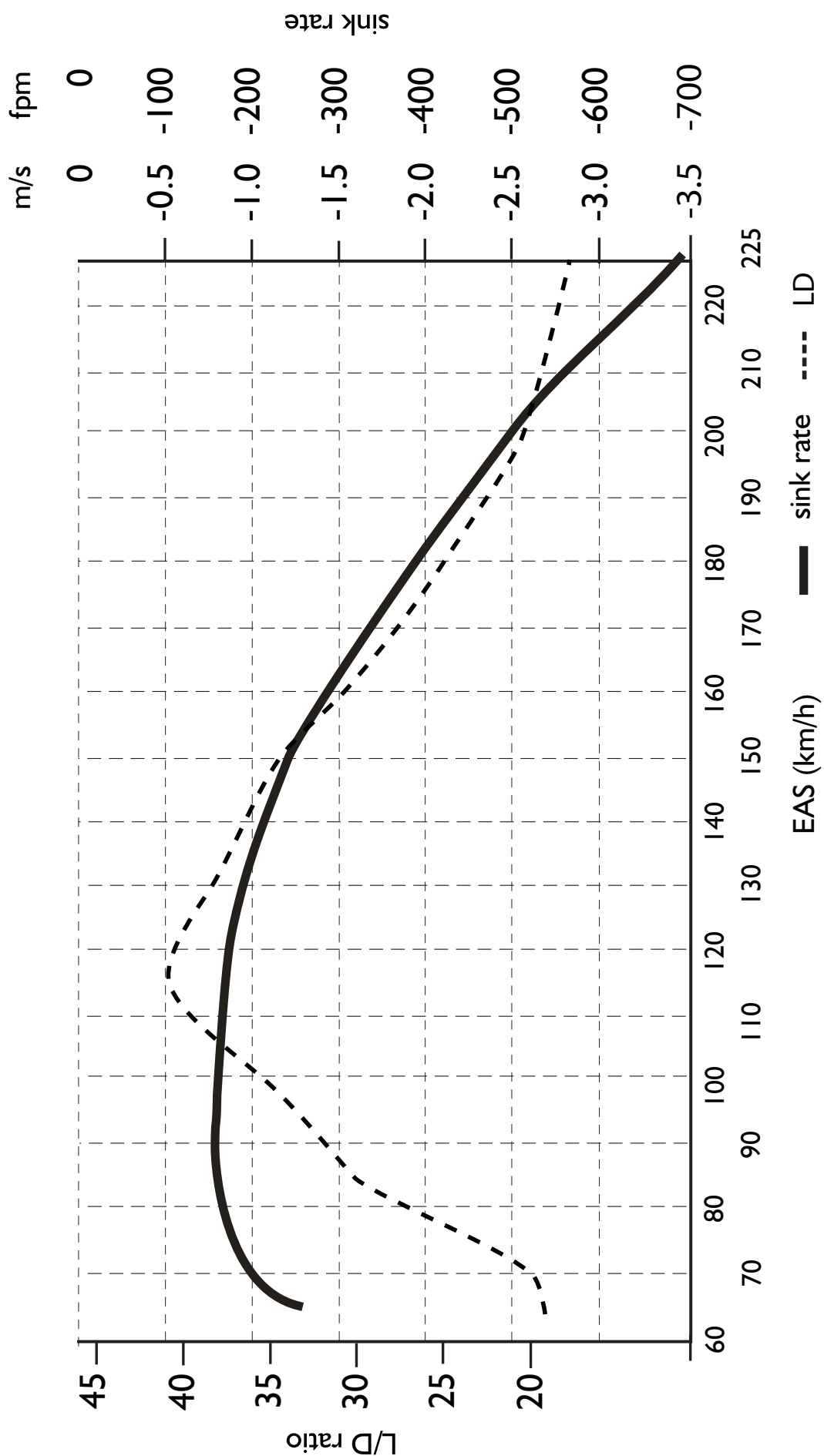
establish rightened flight at speed providing minimum sink rate, if you desire do stay airborne the longest. This may come in handy in case you will be forced to give way to other aircraft or if you simply need time to determine the most appropriate site to land out on.

Taurus	Model 503
minimum sink speed	90 km/h (48 kts)
minimum sink rate (prop.unit., gear retracted)	0.78 m/s (140 fpm)
minumum sink rate(prop.unit extended.)	1.52 m/s (270 fpm)
best lift/drag ratio speed	115 km/h (62 kts)
best lift/drag ratio (prop.unit., gear retracted)	1:41
best lift/drag ratio (prop.unit extended.)	1:25
L/D ratio at 150 km/h (80 kts)	1:33

Maneuver & gust envelope



Speed polar (prop.unit & gear retracted)



Additional technical data

Taurus	Model 503
stall speed (flaps extended)	63 km/h (34.0 kts)
stall speed (flaps retracted)	71 km/h (38.3 kts)
max. speed with spoilers extended	225km/h (122 kts)
max. speed with flaps in T position	130 km/h (70 kts)
max. speed with flaps in L position	110 km/h (60 kts)
manoeuvring velocity Va	163 km/h (88 kts)
maximum rough air speed Vb (gusts 15 m/s)	163 km/h (88 kts)
max. speed with powerplant extended	160 km/h (86 kts)
max. speed in tow	150 km/h (80 kts)
VNE	225 km/h (122 kts)
best climb-over-distance ratio speed Vx	85 km/h (46 kts)
best climb rate speed Vy	100 km/h (54 kts)
max. climb rate at MTOM	2.9 m/s (580 fpm)
minimum sink speed	90 km/h (48 kts)
minimum sink rate	0.78m/s (156 fpm)
max. sink rate with spoilers extended	6.0 m/s (1200 fpm)
best glide ratio speed	115 km/h (62 kts)
takeoff runway length at MTOM	180 m (590 ft)
takeoff runway length at MTOM over 15 m obst.	265 m (870 ft)
service ceiling at MTOM	3900 m (12.800 ft)
best glide ratio	1:41
glide ratio at 150 km/h	1:33
45° left to 45° right - bank to bank time	3.5 s
fuel flow at full power	18 l/h
max. wing load factors	+5.3 G -2.65 G

WARNING! Wing and propeller surfaces must be immaculately clean, dry and undamaged at all times. As all airfoils are laminar any impact spots, bumps and even a dirty (incl. water, snow...) surface may significantly lower flight performance. Stall speed, takeoff and landing runway length, sink rates and fuel consumption increase, while climb rates, ceiling, lift-over-drag ratio and endurance decrease. Some of these are effected by as much as 30%!

Noise levels

Taurus ultralight motorglider's noise levels were officially measured by the German authorities according to the strict German certification basis. The measured noise level produced by the aircraft under full power was 59.8 dB.



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Weight and balance



Introduction

Weighing procedure

Determination of CG

Crew weight limitations

Equipment list

Introduction

This chapter provides information on aircraft's weight and balance, which is essential for safe flight activity. Datum for c.g. determination is wing's leading edge at wing root. MAC is 869 mm, difference between datum and MAC is 67 mm.

Weighing procedure

How to weigh the aircraft and later determine the CG correctly:

Make sure all listed aircraft parts and appliances are installed and in position.

Remove all other objects (e.g. tools, mops ...).

Empty fuel tanks except for the unusable fuel, empty the water ballance reservoir.

Retract flaps and spoilers, leave control surfaces centred. Retract the engine.

Support fuselage at the rear and level the aircraft inside a closed space.

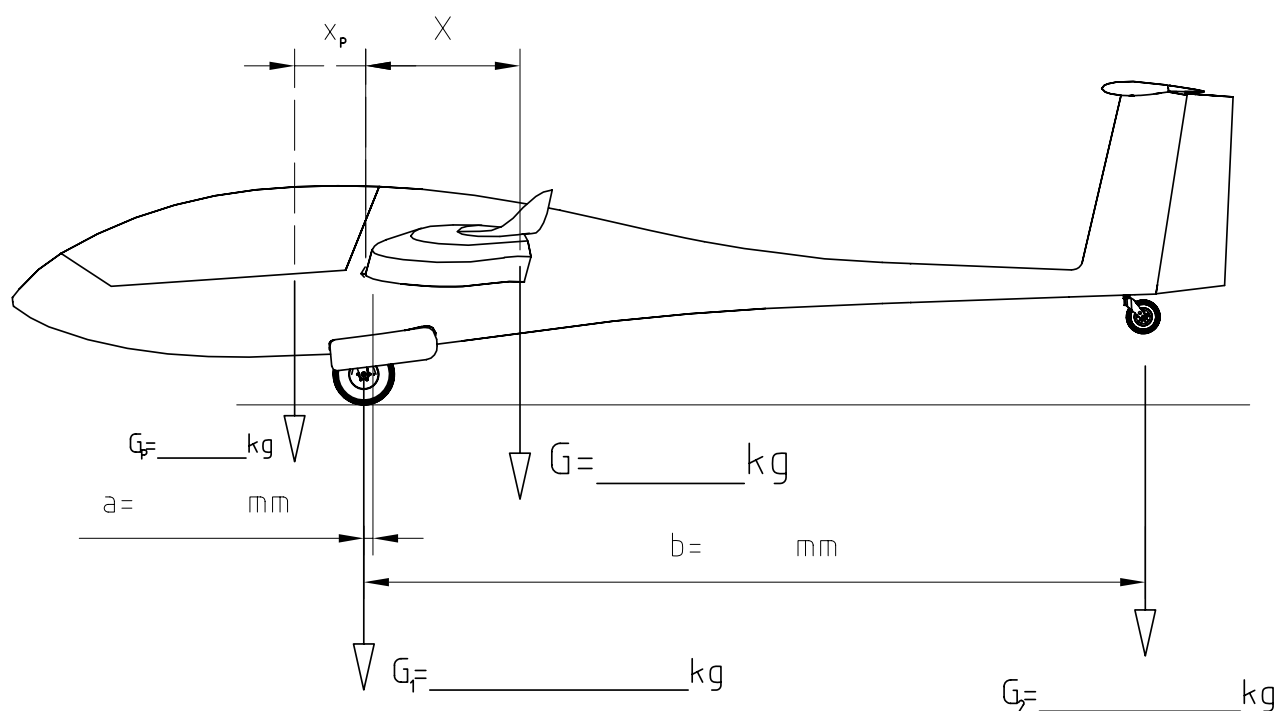
To do this, use a water scale and measure the angle of the tail boom (upper and lower side angles must be the same!) just in front of the vertical fin.

Once leveled, read the scale readings and subtract eventual tare weight.

Perform the weiging in closed space with no disturbances and fill -in the table below.

Weighing form

Weighing point and symbol	Scale reading	Tare	Nett
right main wheel (GR)			
left main wheel (GL)			
main wheels (GR + GL)			
tail wheel (G2)			
total (G = GR + GL + G2)			



Determination of CG

Lever arm of CG:

$$X [\text{mm}] = ((G_2[\text{kg}] / G[\text{kg}] \times b[\text{mm}]) - a[\text{mm}])$$

where a is the distance between datum and front wheel axis and b distance between main wheel axis and tail wheel axis

$$X [\% \text{ MAC}] = (X[\text{mm}] - (67 \text{ mm} - \text{FS}[\text{mm}]) / 869 \text{ mm}) * 100$$

where FS is the forward wing sweep measured wing span of 3324 mm.

Crew weight limitations

Minimum combined pilot weight (no ballast)

$$= G * (X [\text{mm}] - 420 \text{ mm}) / (420 \text{ mm} + 485 \text{ mm})$$

Maximum combined pilot weight (no ballast)

$$= G * (X [\text{mm}] - 203 \text{ mm}) / (203 \text{ mm} + 535 \text{ mm})$$

where X is the lever arm of CG in [mm] and H₂O is the mass of water ballast in [kg].

Minimum combined pilot weight (with water ballast)

$$= (G * (X [\text{mm}] - 420 \text{ mm}) - H_2O * (1950 \text{ mm} + 420 \text{ mm})) / (420 \text{ mm} + 485 \text{ mm})$$

Maximum combined pilot weight (with water ballast)

$$= (G * (X [\text{mm}] - 203 \text{ mm}) - H_2O * (1950 \text{ mm} + 203 \text{ mm})) / (203 \text{ mm} + 535 \text{ mm})$$

where H₂O is the mass of water ballast in [kg].

Additional water ballast data

Water ballast lever: -1950 mm

Maximum water ballast mass: 9 kg

Equipment list

Aircraft's empty weight data is unique for each and every Taurus ultralight motorglider produced.

Taurus model:

Serial number:

Registration number:

Aircraft empty weight:

C.G. of empty aircraft (in mm and %MAC):

FS [mm]:

Installed appliances:

Determination of CG

	Weight (kg)	Lever arm (mm)	Torque (kgcm)	Remarks
Basic cfg. empty weight				
Single pilot		-480		
Two pilots		-535		
Water ballast		-1950		
Totals				

CAUTION! EACH NEWLY INSTALLED PART OR APPLIANCE MUST BE REGISTERED IN THE UPPER TABLE. ALSO, NEW TOTAL WEIGHT AND LEVER ARM OF CG VALUES MUST BE ENTERED AND POSITION OF CG RE-DETERMINED. FURTHERMORE, THE TORQUE MUST BE RECALCULATED. THIS IS RATHER UNCHALANGING TO DO. FIRST MULTIPLY THE NEW PART'S WEIGHT BY IT'S LEVER ARM MEASURED FROM THE REFERENCE POINT (WING'S TRAILING EDGE). THEN SUM UP ALL MOMENTUMS AND DIVIDE THE SUM BY THE NEW TOTAL WEIGHT.

WARNING! AIRCRAFT'S SAFE CENTER OF GRAVITY POSITION RANGES BETWEEN 20% (203 MM) AND 45% (420 MM) OF MEAN AERODYNAMIC CHORD AND IS GREATLY AFFECTED BY COCKPIT CREW WEIGHT. FUEL WEIGHT IS NOT A FACTOR REGARDING THE C.G.

Aircraft and systems on board



Introduction

Cockpit levers

Instrument panel

Undercarriage

Seats and safety

harnesses

Pitot-static lining

Air brakes (spoilers)

Flap settings

Power plant and propeller

Fuel system

Electrical system

Engine cooling system

Engine lubrication system

Wheel brake system

Introduction

Taurus is a 15-meter-wingspan, side by side T-tail motorglider made almost entirely of composite materials. The wing is mid-mounted cantilever type, propulsion system is fully retractable to enhance gliding performance

The undercarriage is a taildragger type with two main, brake equipped, which are fully retractable. Tail wheel steerable through rudder input.

Taurus features flaperons, interconnected flaps and ailerons presented in the same deflecting surface. Flaps offer 5 settings: neutral, 1st, T, L and the negative position of which none have any impact on aileron deflections whatsoever. What is more, individual main flight control levers make Taurus ideal for initial as well as for advanced flight training. All aileron, elevator and flap controls are connected to the cabin controls using self-fitting push-pull tubes. Rudder deflects via cables. The elevator trim is mechanical, spring type.

All aircrafts ship with H type safety harness attached to the fuselage at three mounting points. Rudder and belonging brake pedals can be adjusted to suit your size and needs.

Fuel tank is located inside the wing. Fuel valve is located on the bottom middle console in the cockpit. Fuel hose connectors are self securing - this prevents fuel spills when disassembling the aircraft. The gascolator is located in on the bottom central fuselage.

Refuelling can be done by pouring fuel through the reservoir openings on top of the wings or by using an electrical fuel pump instead.

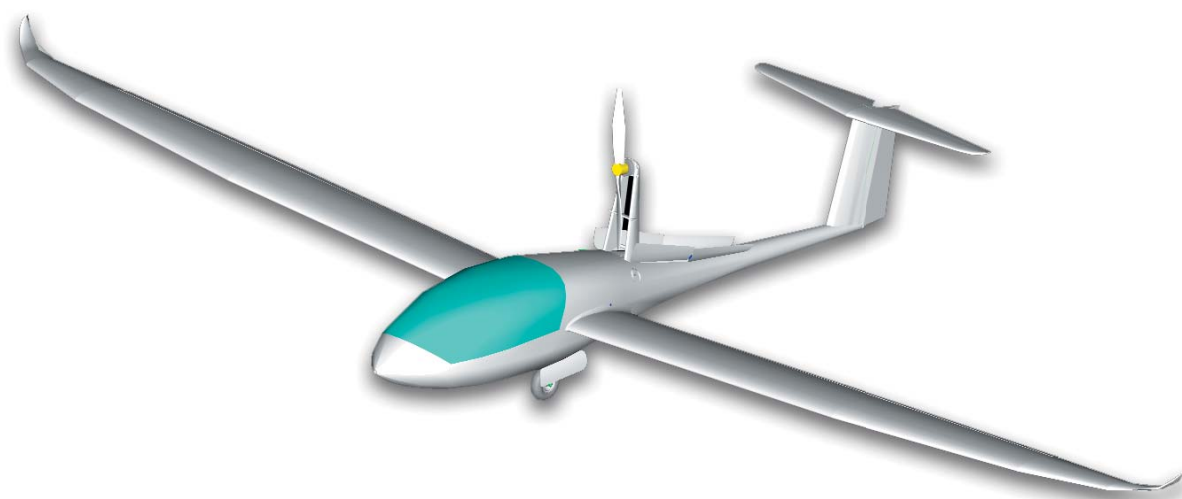
The canopy is either transparent or blue-tinted plexy-glass.

Main wheel brakes are hydraulic driven disc type. The hydraulic brake fluid used is DOT 3 or DOT 4. Cabin ventilation is achieved through special ducts fitted onto the canopy frame and may be adjusted for crew's comfort.

To enhance aerodynamics for gliding, Taurus fully retracts the propulsion unit. This procedure is fully automated and invoked by only a switch of a button on the instrument panel.

Electric circuit enables the pilot to test individual circuit items and to disconnect the entire wiring but leave the engine running, should there come to a distress situation. Navigational (NAV), and anti collision (AC) lights are an option. The engine/propeller compartment is fully enclosed and separated from the cockpit.

Basic instruments come installed with operational limits pre-designated. Also, signal lights indicating danger zones are provided. A parachute rescue system is provided serially.



Composite parts are made of:

fabric:	AFK 170, GG90, GG 120, GG160, GG200, 90070, 92110, 92120, 91125, 92140, 92145, KHW200
roving:	NF24
foam:	75 kg/m ³ PVC 3mm, PVC 5 mm, PVC 8mm
honeycomb:	kevlar 3mm
GFK:	3 mm, 5 mm, 7 mm of thickness
paint:	gelcoat
heat resistant protection	glass-aluminium sandwich

Medal parts used are:

tubes:	materials: Fe0146, Fe 0147, Fe0545, Fe1430, AC 100, CR41 in LN9369
sheet metal:	materials: Fe0147 in Al 3571
rods:	materials: Fe 1221, Fe 4732, Č4130, Al 6082, CR41 in Al 6362
cable:	AISI 316
bolts and nuts:	8/8 steel

All composite parts are made of glass, carbon and kevlar fiber manufactured by Interglas GmbH.

All composite parts have been tested at a safety factor of 1.875 in 55 °C atmosphere. All parts are made in moulds, therefore no shape or structural differences can occur.

All desinging, manufacturing and testing complies with following regulations:

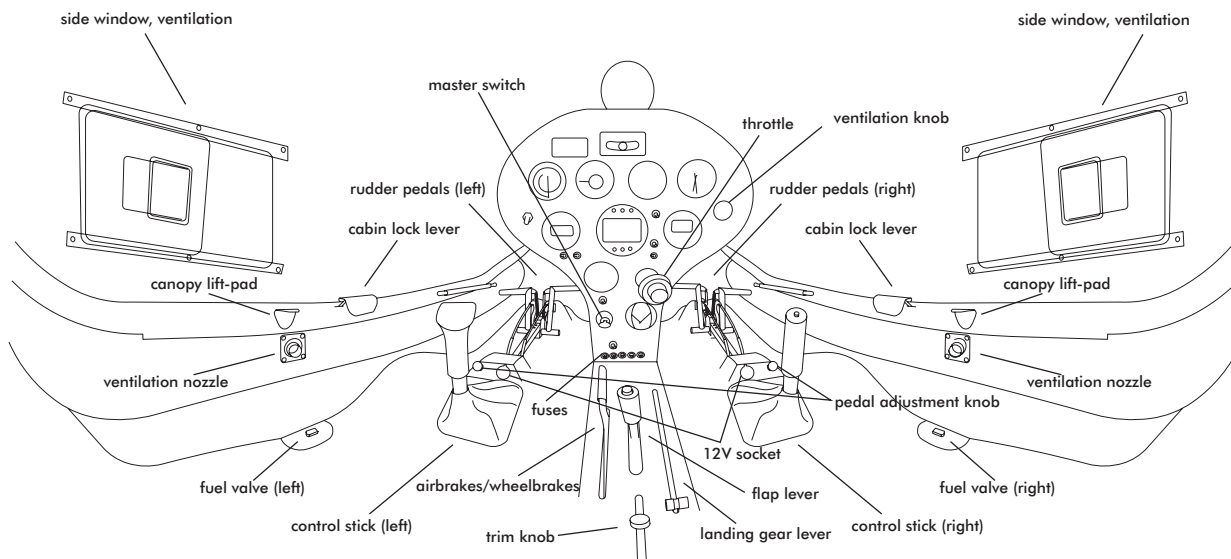
- Bauvorschriften für Ultraleichtflugzeuge des Deutschen Aero Club e.V. Beauftragter des Bundes-ministeriums für Verkehr
- JAR-1 microlight definition
- JAR-22 - certain sections
- JAR-VLA -certain sections

for Slovenian market also: Pravilnik o ultralahkih napravah Republike Slovenije.

All parts and materials presented in Taurus ultralight motorglider are also being used in glider and general aviation industry and all comply with aviation standards.

Cockpit levers

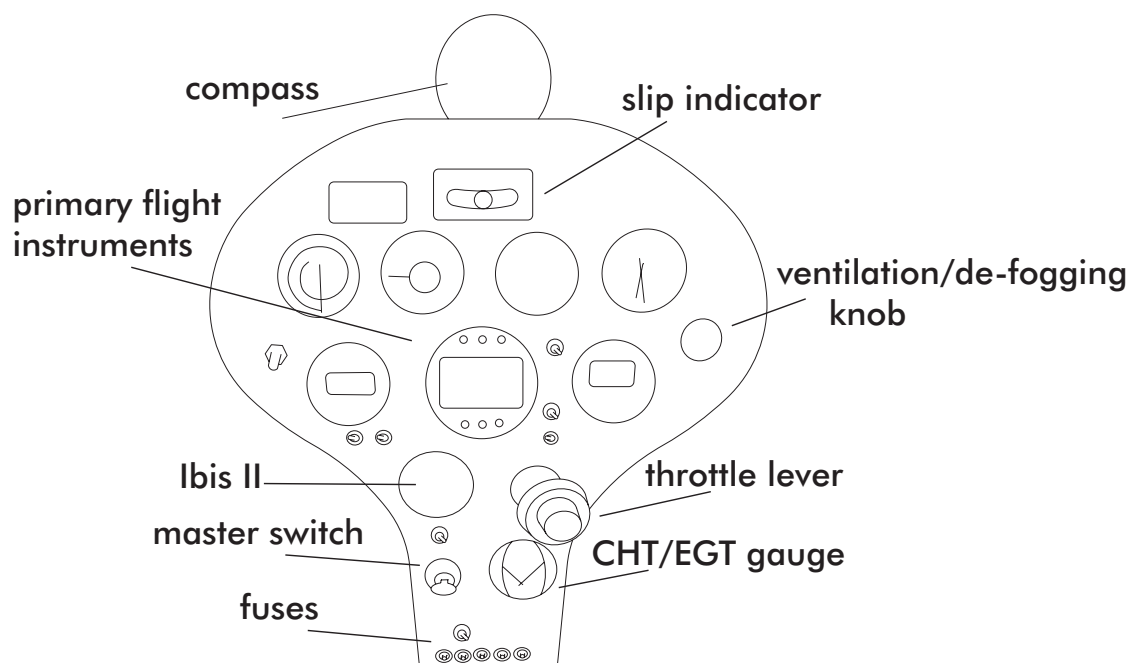
Taurus ultralight motorglider's cockpit levers are divided into two groups:



Individual control levers: pilot stick, rudder pedals with belonging length adjustment levers

Joint control levers: throttle lever, flap lever, gear retraction lever, trim lever, airbrakes lever, canopy lock levers, ventilation lever and emergency parachute release handle.

Instrument panel

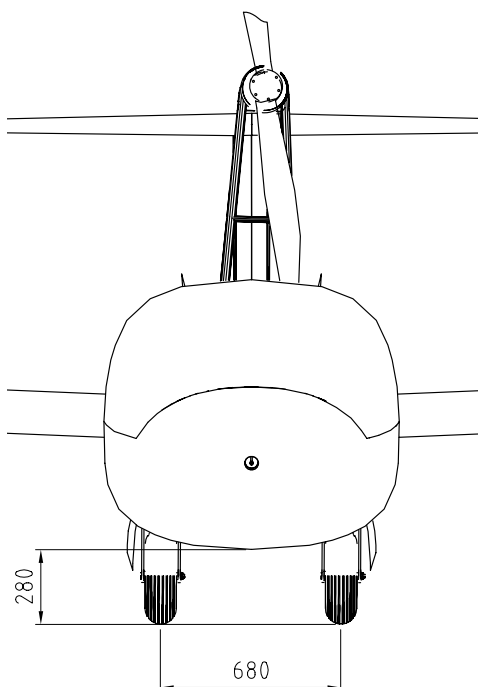


Taurus ultralight motorglider ships with a modern, electronic instrument panel. The panel utilizes the power of the engine control and monitoring instrument. Besides the conventional instruments the panel includes a magnetic compass, a side-slip indicator, 12 V charge indicator, cockpit ventilation lever, throttle lever, master switch, fuses, CHT/EGT gauge and primary flight instruments.

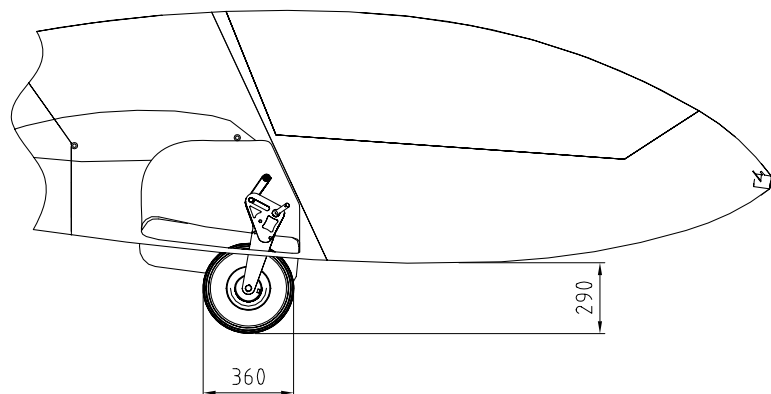
Undercarriage

The undercarriage is a taildragger type with two main, brake equipped, retractable wheels and a free-spinning or rudder-guided tail wheel. Main gear is retracted / lowered by operating a lever located between both seats, accessible to both crew. Once main gear is lowered it is locked into position automatically. Wheel brakes are both engaged simultaneously when the airbrakes are fully extended and the pilot continues to pull on the airbrake lever.

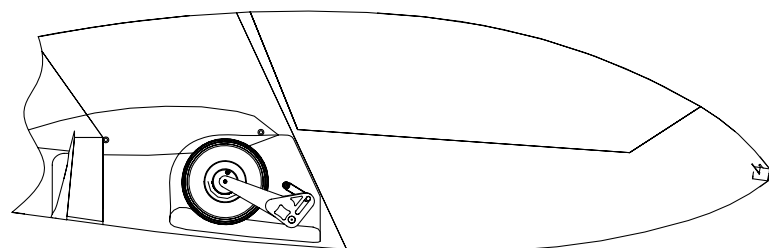
distance between main wheels:	0,68 m
distance between main and tail wheel:	4,27 m
tire:	4,00" x 6" (main wh.), 2,50" x 4" (tail wh.)
tire pressure	1,5 - 1,6 kg/cm ² (main wh.), 0,6 kg/cm ² (tail wh.)
brakes:	disk type, engaged simultaneously upon full airbrake extension
brake fluid:	DOT 3 or DOT 4
main wheel axis to tail wheel distance:	4,25 m



**Main gear lowered and locked
(front view)**



Main gear lowered and locked (side view)



Main gear retracted (side view)

Seats and safety harnesses

Seats have no stiff internal structure and do not offer different settings. All Taurus ultralight motor-gliders ship with H type safety harness attached to the fuselage at three mounting points.

Pitot-Static lining

The pitot tube is inside the nose-tip. Pitot lines made of composite materials lead from there to the instrument panel and are secured from unintentional damage.

Air brakes (spoilers)

Spoilers are most commonly used to increase drag and steepen the final approach. During takeoff, climb and cruise spoilers **MUST** be retracted and locked (handle in cockpit in full up position). To unlock and extend spoilers, pull the handle upwards.

Flap settings

Taurus ultralight motorglider is equipped with flaperons which offer five (5) different flap settings. Apart from the limitations for extension of +9° and +18° flaps, there are recommendations for the use of flaps with different speed-ranges and types of flight operation.

Recommended speed ranges for certain flap settings in when gliding:

flaps in negative position; -5° (up):	faster than 150 km/h km/h (80 kts)
flaps in neutral position; 0° (neutral):	120 - 150 km/h (65 - 80 kts)
flaps in 1 st position; +5° (down):	90 - 120 km/h (50 - 65 kts)
flaps in T position; +9° (down):	80 - 90 km/h (43 - 50 kts)
flaps in L position; +18° (down):	FINAL APPROACH - LANDING

Water ballast reservoir

Taurus ultralight motorglider is equipped with a water ballast reservoir to provide for better control over the aircraft centre of gravity. The reservoir is placed in front-cabin and secured with two (2) fastening butterfly screws with a retaining mechanism. The quantity of the reservoir is 9 litres (9 kg). Lever arm for centre of gravity calculations is XXX mm. There are placards on the instrument panel indicating minimum and maximum allowable crew weight with and without (9 kg) water ballast. The mentioned figures are to be respected at all times!

WARNING! CHECK THE WATER BALANCE RESERVOIR IN FRONT-CABIN AND VERIFY CREW'S WEIGHT BEFORE EVERY FLIGHT AS IT MAY INFLUENCE THE CENTRE OF GRAVITY OF AIRCRAFT TO THE POINT WHERE IT IS NO LONGER CONTROLLABLE!

Power plant and propeller

Taurus has an engine mounted inside a fully enclosed compartment in the rear of the fuselage. The propeller is mounted on a composite swing-arm and is driven via an enclosed belt-drive system. The whole propulsion unit can be lowered for gliding or raised for powered flight by simple use of Ibis II, the propulsion control and monitoring instrument.

Engine:

Engine:	ROTAX 503 (two-stroke inline, two cylinders, 497 cm³) twin carburated - double electronic ignition
cooling:	fan cooling
lubrication:	by adding oil into fuel or using an independent oil pump
reduction gearbox:	Rotax type "B" or "C"
reduction ratio:	1 : 2,58 or 1: 2,62 (1:3 optional)
el. generator output power:	170 W at 6000 RPM
starter:	electric
engine power:	45 (49) HP at 6600 RPM
battery:	12 V, 8 Ah

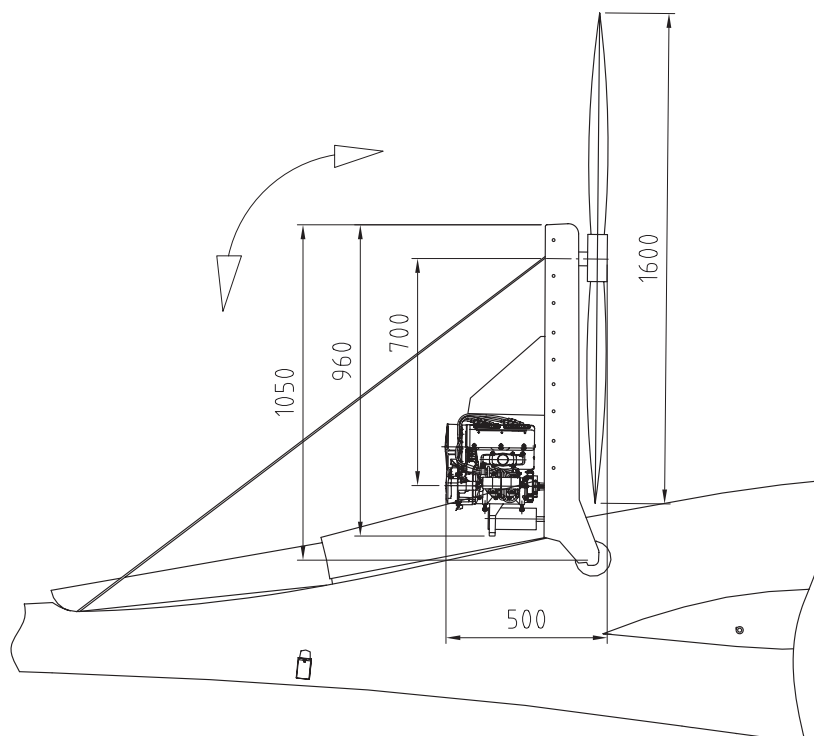
All metal ropes used are bowden cables.

Propeller:

Taurus propeler:	twin blade, fixed pitch composite propeller - diameter 1600 mm
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Engine, swing-arm and propeller schematic

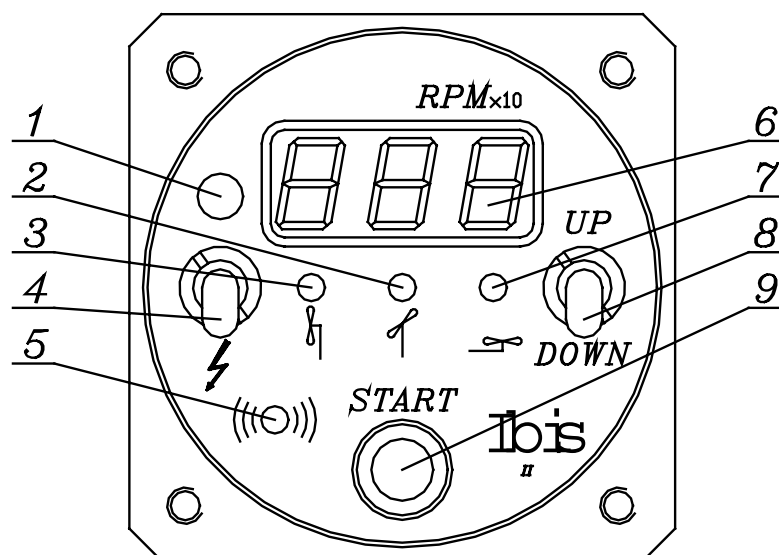
Note: Dimensions are approximate.



Ibis II - propulsion control & monitoring instrument

In order to simplify aircraft handling, Ibis II system takes complete control over the propulsion unit except for throttle and choke, which are operated by cockpit levers. The system is very light and reliable as all switches and sensors used to monitor the operations are inductive type and as such not sensitive to vibration, mechanical damage and/or dirt.

Panel view:



- ① **Ignition warning light** – when the propeller arm is extended and the ignition still switched off, a red light is flashing.
- ② **Propeller status light** – when the propeller is in vertical position, a yellow light is on.
- ③ **Propeller arm extended** – when the propeller arm is extended, a green light is on.
- ④ **Ignition switch** – when the switch is the up position, the ignition is on. In this case the ignition warning light stops flashing. If the switch is down, the ignition is off.
- ⑤ **Speaker**
- ⑥ **LED display** – it displays the engine RPM while the engine is running e.g. 621 = 6210 RPM. When the engine is not running, the display indicates the engine hours count (up to 400 hours) If the master switch is switched off and back on while the engine is extended, the display shows up to 99.9 hours with .1 hour precision
- ⑦ **Propeller arm retracted** – when the propeller arm is retracted completely, a green light is on.
- ⑧ **Propeller arm control switch**
- ⑨ **Engine starter button** – Starter will be activated only when the engine is completely extended and the ignition is switched on. Otherwise the starter remains inactive even if this button is pressed. The starter is also inactive while the engine is running. This button has an additional function; while the propeller arm is retracting, press this button to stop it in any position (in order to cool down the engine). Press the same button again to reactivate the retraction.

Extending the propeller arm:

WARNING! BEFORE EXTENDING THE PROPELLER ARM IN-FLIGHT, SET FLAPS TO T STAGE AND REDUCE SPEED TO 90 KM/H (50 KTS).

1. Turn the master switch ON (key full to the right).

The LED display indicates the engine hours count, Propeller arm retracted and Propeller status indicator light are on.

2. Switch the Propeller arm control switch to UP.

The propeller arm is raised to the final extension point where the Propeller arm extended indicator lights up. A sound signal (30 seconds) will be activated and the Ignition warning light will flash if the ignition is still off at this point.

3. Switch the ignition switch ON to prepare the engine for start-up.

Starting the engine (continued from Extending the propeller arm):

CAUTION! BEFORE STARTING-UP THE ENGINE, VERIFY THE PROPELLER ARM IS EXTENDED AND PROPELLER IN VERTICAL POSITION BY CHECKING THE COCKPIT MIRROR.

1. Set throttle 1/2.

2. Press the START button.

When the engine is running, the display will show engine RPM.

Shutting-down the engine:

1. Turn the ignition switch down.

This will switch the ignition off and shut the engine down. A sound signal (30 seconds) will be activated and the Ignition warning light will be flashing while the LED display shows the engine working hours.

Retracting the propeller arm:

WARNING! BEFORE EXTENDING THE PROPELLER ARM IN-FLIGHT, SET FLAPS TO L STAGE AND REDUCE SPEED TO 70 KM/H (40 KTS). THE ENGINE MUST BE STOPPED BEFORE APPLYING THIS PROCEDURE!

1. Switch the Propeller arm control switch to DOWN.

The system now enters retraction mode. The propeller arm is moved backwards by approximately 15 degrees to the point where the propeller needs to be positioned vertically. At the speed of 85 to 95 km/h the propeller is wind-milled slowly. Use the cockpit mirror to monitor propeller wind-milling and increase/reduce airspeed (or use the starter button) if necessary. When the propeller reaches vertical position, it is automatically stuck. Propeller status is indicated by the yellow light. The system waits for two more seconds to verify there is no further movement of the propeller, before the propeller arm retraction continues. When the engine is completely retracted, the green engine retraction control light is on.

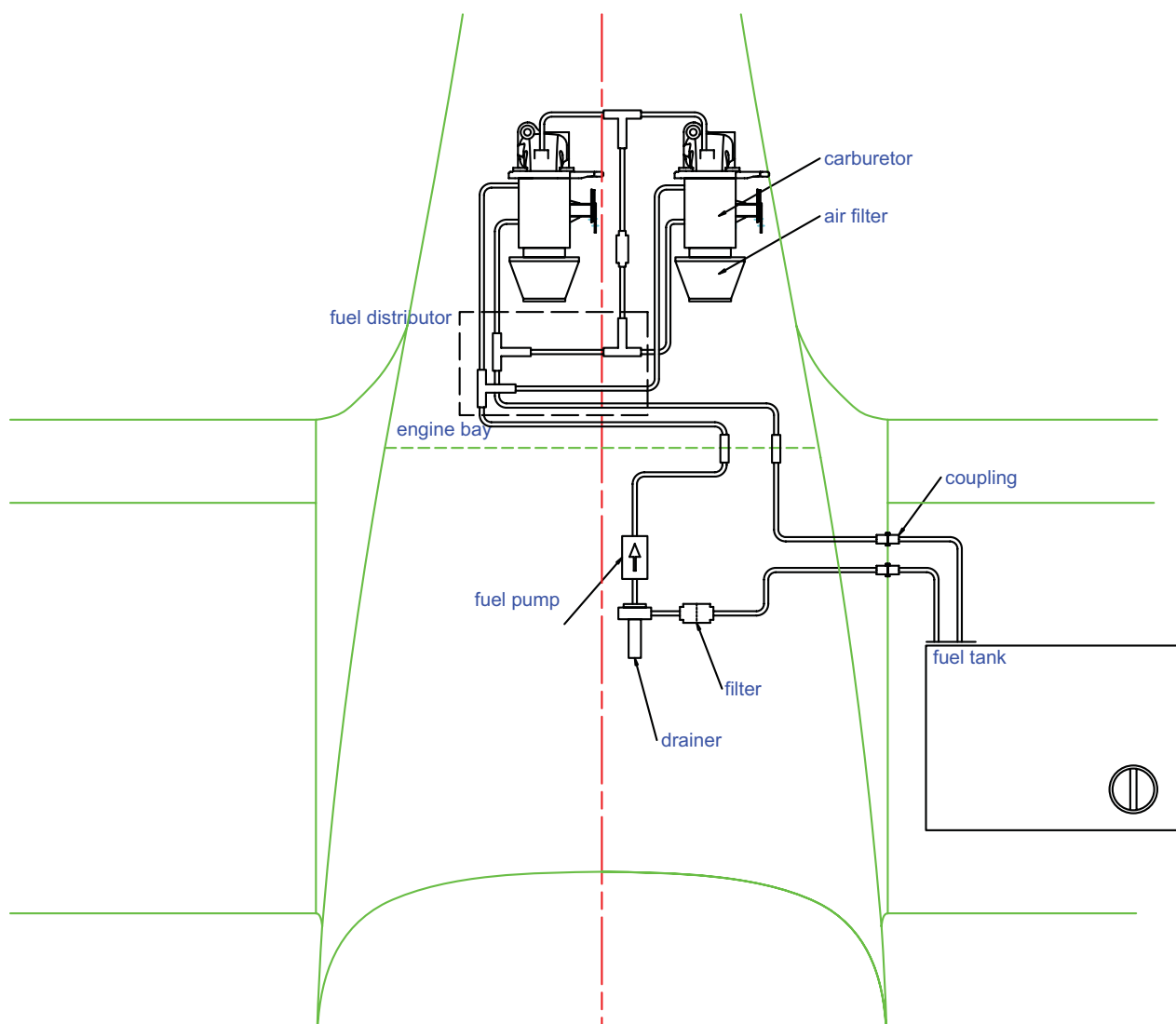
Fuel system

description:	vented wing fuel tanks with refueling aperture on top of the wings
fuel selector valves:	only with optional 2 x 30 liter reservoir, separate for each tank
gascolator:	filter equipped with drain valve
fuel capacity:	1 x 30 liters (option 2 x 30 liters)
unusable fuel:	2 liters (5 liters)
fuel filter:	metal, inside the gascolator AND paper filter before gascolator

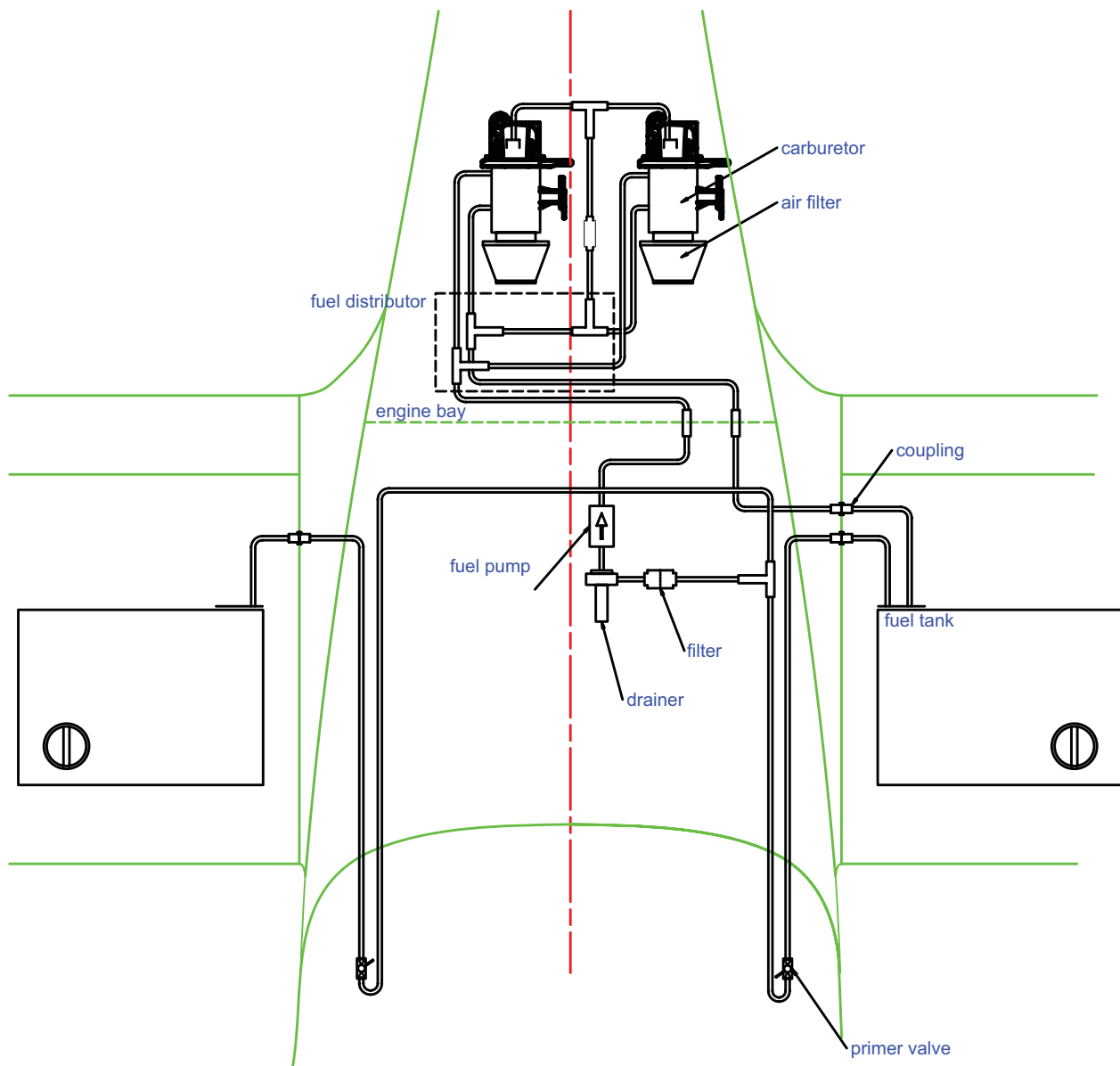
All fuel hoses are protected with certified glass-teflon cover. There is a fuel return circuit leading excess fuel back into the port (left) wing tank.

CAUTION! DUE TO THE POSITION OF THE FUEL RESERVOIR SUPPLY POINT, FLYING IN NSIDERABLE SIDESLIP FOR A LONGER TIME MAY RESULT IN FUEL STARVATION TO THE ENGINE IF THE FUEL TANK IN THE OPPOSITE DIRECTION OF THE SIDESLIP IS CLOSED. SHOULD THIS OCCUR, RIGHTEN THE FLIGHT AND RE-OPEN THE FUEL TANK IN QUESTION (if equipped with 2 x 30 tanks) IMMEDIATELY TO PREVENT ENGINE FAILURE.

Schematic of fuel system - model 503, single fuel reservoir



Schematic of fuel system - model 503, two fuel reservoirs



Electrical system

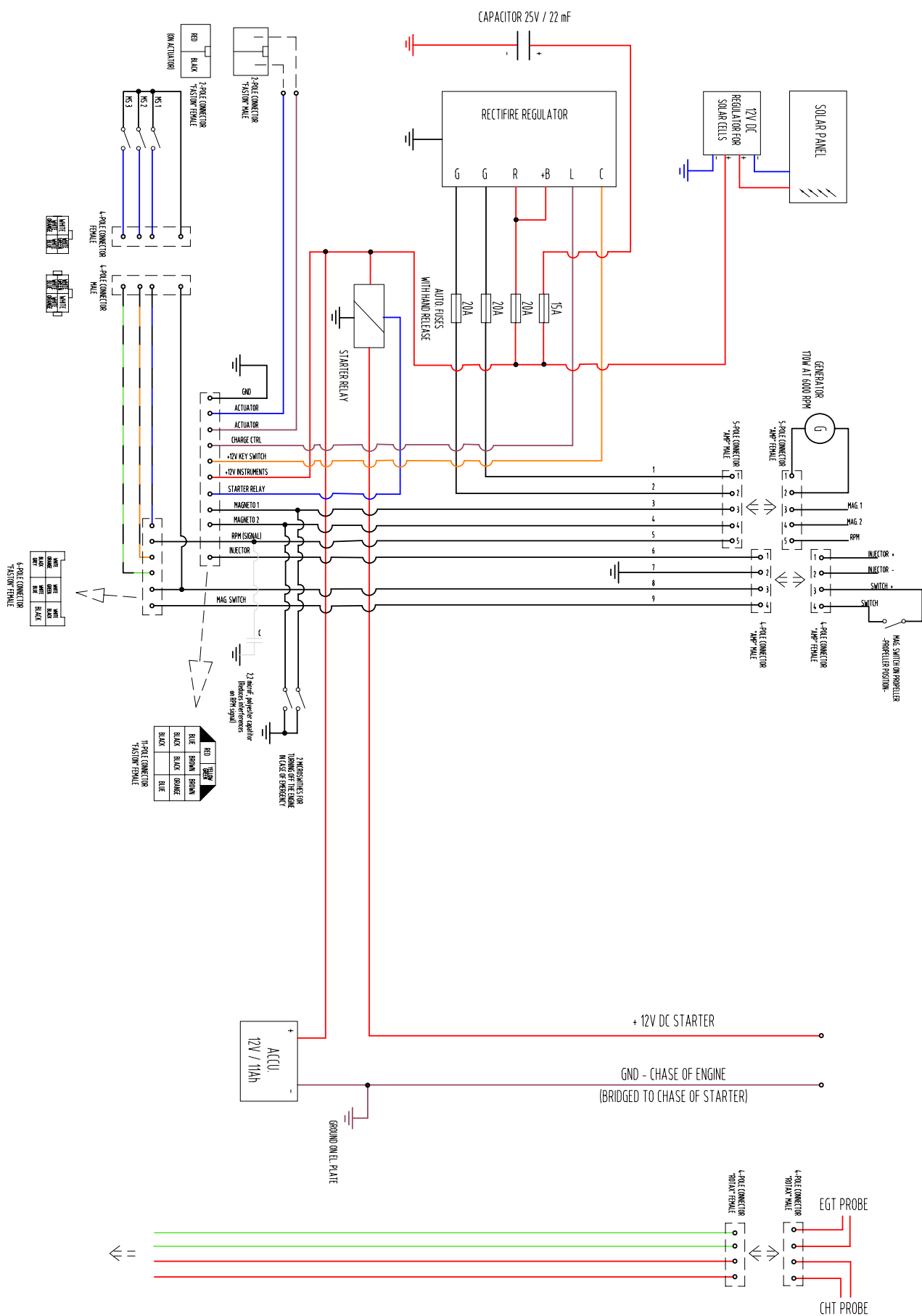
description: Double separated magneto ignition. Standard, 12 V circuit charges the battery and provides power to all appliances and instruments.

master switch: key type

magneto switches: magneto test flip-switch (default position is BOTH ON)

battery: 12 V, 8 Ah or 5 Ah

Schematic of electrical system (single battery)



Engine cooling system

Rotax 503 cooling system

The Rotax 503 engine (Taurus ultralight motorglider Model 503) is aircooled by taking advantage of propeller airflow. Cold air accelerated by the propeller enters the duct intake mounted on the propeller arm and is then forced to spread over the engine cooling ribs. The air is then blown out of the engine compartment behind the engine.

Engine lubrication system

Rotax 503 is a two-stroke engine and is adequately lubricated by oil/fuel mixture. Proper lubrication is ensured by adding 2% of syntetic or semi-syntetic oil into the fuel canister.

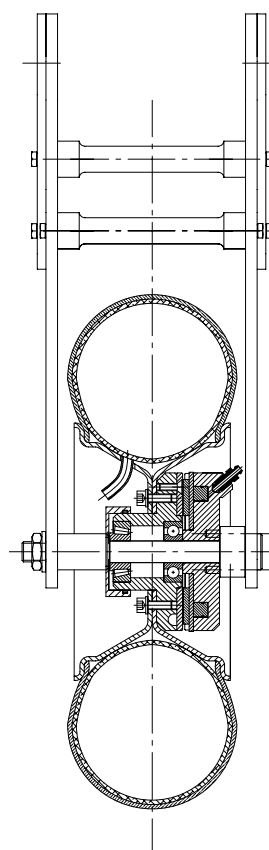
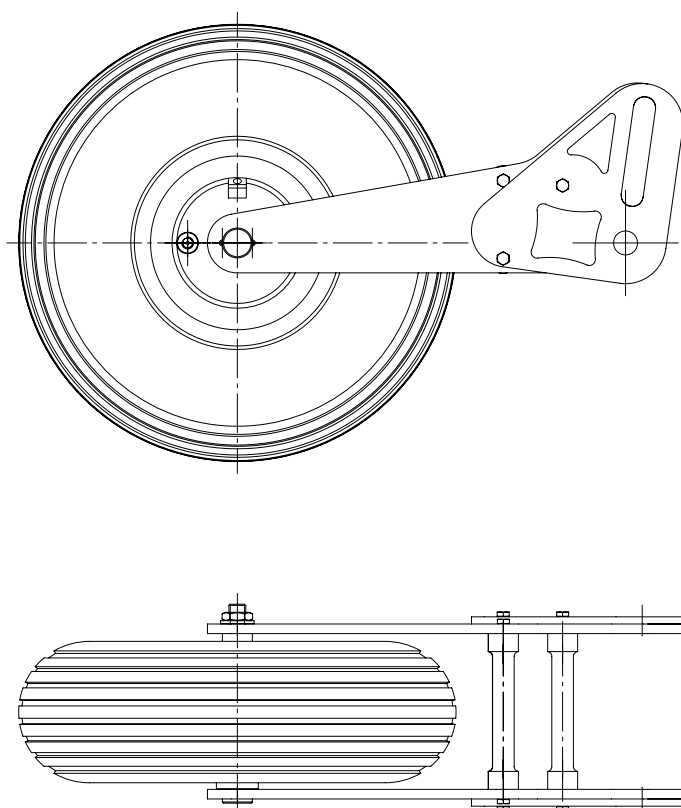
Wheel brake system

Wheel brake system features common braking action for both main wheels. Wheel brakes are hydraulically driven disc type

Wheel brakes are operated by extending the airbrakes' lever past full extension point.

Hydraulic brake fluid used for hydraulic type brakes is DOT 3 or DOT 4.

If the braking action on your aircraft is poor whilst the full backward pressure applied on the airbrakes' handle, please see chapter Handling and Maintenance of this manual to learn how to rectify this problem.



Handling and maintenance



Introduction

Inspection periods

**Repairs and
spare part replacements**

Preventative maintenance

Special check-ups

Draining and refuelling

Tie down

Storage

Cleaning

**Keeping your aircraft in
perfect shape**

Introduction

This chapter determines handling and (preventative) maintenance terms. Also, recommended ground handling is presented.

THE FOLLOWING ARE PROVISIONAL VALUES SUBJECT TO CHANGE WITHOUT NOTICE!

Inspection periods

See "Service manual".

Repairs, spare part replacements and preventative maintenance

All major repairs and spare part replacements MUST be done by authorised service personnel.

However, you are encouraged to take care of preventative maintenance yourself. This includes: **tire and wheel bearings replacements, safety wire replacements, door and safety harness replacement, light bulb replacements, fuel hose replacements, battery servicing and replacement, sparks and spark plugs replacements and air filter replacements.**

The table below indicates recommended maintenance periods (see Service manual for detailed information).

Table legend:

- C** Check-up - visual only, check for free play and whether everything is in position - **DO IT YOURSELF**
- CL** Cleaning - **DO IT YOURSELF**
- LO** Lubricating, oiling - lube all designated parts and spots using proper lubricant - **DO IT YOURSELF**
- R** Replacement - replace designated parts regardless of state and condition.
You are encouraged to **DO** undemanding replacements **YOURSELF**, otherwise have replacements done by **AUTHORISED SERVICE PERSONNEL**
- SC** Special check-up - measuring, verifying tolerances and functionality - **DONE BY AUTHORISED SERVICE PERSONNEL ONLY**
- O** Overhaul

	EACH	daily	first 5 hours	50 hours	100 hours	250 hours	500 hours	1.000 hours	10.000 hours
WING AND TAIL SURFACES								SC	O
surface and structure condition		C				SC			
deflections without free play		C			SC				
bearings - moving parts' bushings		C					SC		
lights		C							
self-adhesive sealing tape		C	C		R				
horizon. tail mount		C	C		SC				
drain holes		CL							

	EACH	daily	first 5 hours	50 hours	100 hours	250 hours	500 hours	1.000 hours	10.000 hours
FUSELAGE								SC	O
surface and structure condition		C						SC	
elevator control tube bearing					C		SC		
doors, hinges		C	C		SC	LO			
rudder control wires and hinges			C	C			SC		
drainage holes		C		CL					

								SC	O
CABIN									
control levers, instr. panel, seats		C			SC				
control levers' free play		C	C		SC				
instruments and pitot-static		C			SC		test		
glass surfaces: clean, attached		C	C			SC			
rivet condition		C					SC		
safety harnesses and attach. points		C			SC				
parachute rescue sys. activation handle		C					SC		
wing connectors: fuel, electrical		C	C		SC				
bolts and spar pins		C	C		SC				
wing main bushings, control connectors					SC				

									O
UNDERCARRIAGE									
tires		C	C			R			
wheel axis and wheels					C				
wheel bearings				C		SC	R		
wheel fairings		C	C	C					
tail wheel mounting bolt									check and fasten every 50 landings

								R	
CONTROLS									
general free play		C	C		SC				
control stick		C			LO		SC		
rudder pedals (damage, centered, paral.)		C	C		C	LO			
rudder wire rope		C			SC				
bolts, visible bearings (tail, fuselage)					SC	LO			
difficult-to-reach bearings (wings, under cabin floor)							LO		
aileron, elevator and rudder hinges					SC	LO			
equal spoiler extension, undisrupted m.		C			SC		LO		
spoiler plate springs stiffness		C							
flap handle		C			SC	LO			
elevator trim				C		LO			
springs: flaps, rudder, el. trim, stablizer main fastening bolt					LO	C	R		
airbrakes internal connector rod (if flown or stored where possibility for corrosion is increased (oceanside, wet regions...))									replace every 2 years
spoilers' (airbrakes') drive fine adjustment									see page 73 for detailed description

								SC	O
PITOT-STATIC LINING									
instrument to pitot tube lining			C		C				
instrument setting		C	C						
pitot tube condition (clean, firmly att.)		C	C						
whole pitot-static lining			C		C				

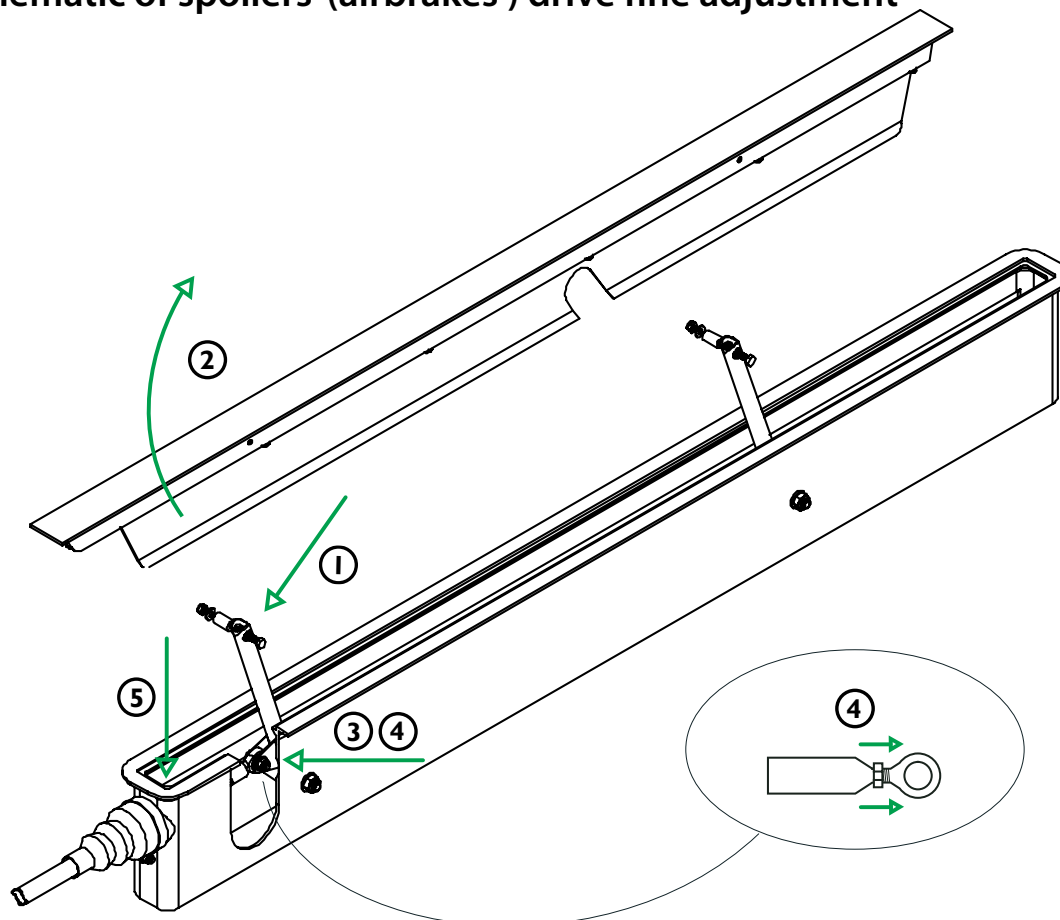
	EACH	daily	first 5 hours	50 hours	100 hours	300 hours	500 hours	1.000 hours	10.000 hours
ENGINE									
see enclosed Rotax engine manual for detailed engine maintenance information.									
In addition to Rotax manual:									
two-stroke engines (overhaul every 300 hours)				C					
cylinder head and exhaust pipe bolts (two-stroke engines)			C		C				
engine bearer dumpers and other rubber parts			C		SC	R			
air filers		C	C		CL	R			
elect. terminals, joints and connectors, hoses		C	C		SC				
pre-chamber and exhaust silencer		C	C		SC		R		
exhaust pipe springs and fire protect.		C	C		R				
throttle wire drive						R			
ENGINE CONTROL									O
throttle lever wire ropes		C	C		SC	R			
levers		C			SC				
PROPELLER AND SPINNER						SC	O		
surface condition		C							
fastening bolts		C				R			
propeller bushings						R			
propeller balance					C				
FUEL LINES									O
general leakage		C	C		SC				
water inside gascolator		C							
dirt and gascolator filter			CL	CL	CL	R			
engine hoses and temp. protection		C			SC		R		
wing fuel tank caps		C							
fuel tank caps washer					R				
auxillary fuel pump				C					
fuel valves leakage		C							
ELECTRICAL WIRING								SC	R
battery			C		SC		R		
instr.panel wires and connectors			C		C				
fuses (instrument panel - automatic)			C	C	C	C	C	C	C
fuses (engine electrical panel)			C	C			R		

	EACH	daily	first 5 hours	50 hours	100 hours	300 hours	500 hours	1.000 hours	10.000 hours	SC	R
PROPULSION UNIT											
transmission belt				C	SC	R					
engine retaining wire		C	C		SC	R					
engine bay door rubbers ropes		C			R						
exhaust system springs		C	C	C	R						
exhaust system rubber		C		R							
carburetors			CL								
rubber shock absorbers (main)		C				R					
rubber shock absorbers (actuator)		C			R						
fuel filter (paper filter)						replace every 25 hrs					
engine-propeller arm						CHECK CONDITION EVERY DAY					

Spoilers' (airbrakes') drive fine adjustment

CAUTION! PERFORM THIS OPERATION ONLY ONCE AFTER FIRST 50 FLIGHT HOURS! CHECK SPOILERS THOROUGHLY FOR UNOBSTRUCTED, SMOOTH AND EVEN EXTENTION EVERY 200 FLIGHT HOURS!

Schematic of spoilers' (airbrakes') drive fine adjustment



(see next page for detailed description)

Perform the adjustment as follows:

- ① **Unscrew and remove the inner horizontal bolt of the airbrake's plate. Do not lose any parts!**
- ② **Lift the airbrake in order to make room for further operation.**
- ③ **Unscrew and remove the bolt attaching the rod-end bearing to the airbrake's plate lever. Do not lose any parts!**
- ④ **Rotate the rod-end bearing fine-setting nut 360° so that the rod end moves towards the other end of the airbrake's box (length of rod increases). Make sure you secure this nut after turning it for 360°!**
- ⑤ **Grease the drive around the rubber sleeve inside the airbrake's box using rubber-non-aggressive lubricant spray.**

Once you have accomplished this, repeat steps 1-3 in opposite order (3,2,1). Make sure you apply adhesive (e.g. Loctite) on all screws when reattaching!

Perform the procedure at the other airbrake as well. In the end verify airbrakes for equal extension.

WARNING! SHOULD THE AIRBRAKES NOT RETRACT EVENLY, APPLY STEP ACTION 4 AGAIN FOR THE AIRBRAKE, WHICH REMAINS HIGHER WHEN RETRACTING.

Clicking noise behind the cockpit

The wings are factory fitted to the fuselage to make a tight fit at approximately 20° Celsius. When exposed to low temperatures, materials shrink. Therefore, flying in the winter or in cold temperatures, you may encounter "click-clack" like noises above your head. The remedy for this unpleasant noises is to add washers, typically of 0,5 mm thickness in-between wing and fuselage. Washers must be added both at rear and front bushings at one side of the fuselage only!

WARNING! IT IS MANDATORY TO CONSULT THE MANUFACTURER OR AUTHORISED SERVICE PERSONNEL BEFORE APPLYING WASHERS!

Venting the hydraulic brakes' lining

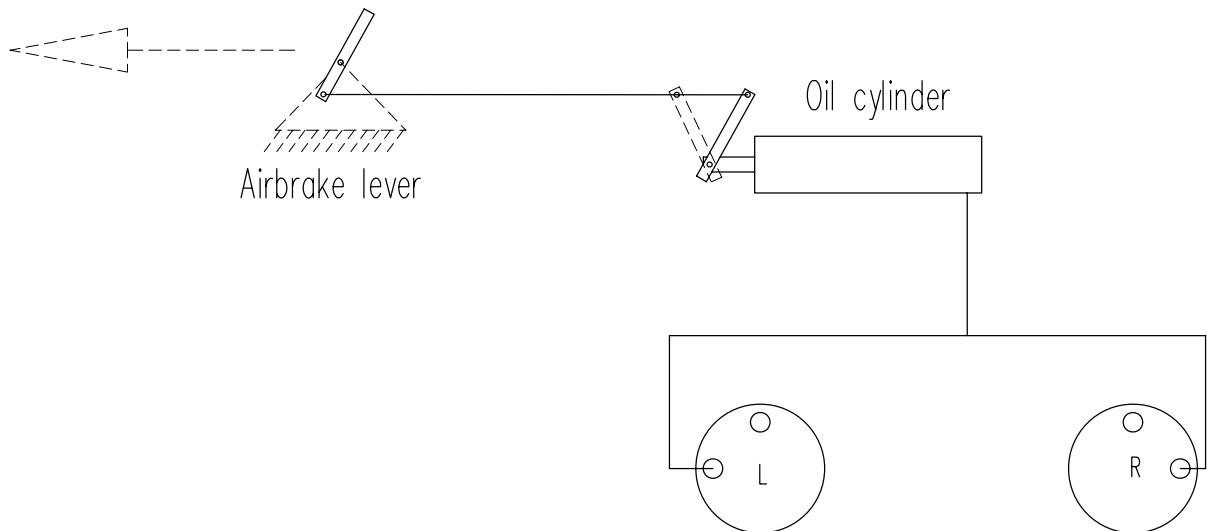
In case you notice poor braking action even when hydraulic brake levers are depressed fully, it is most definitely necessary to vent the hydraulic lining. To do so, first unscrew the caps of small fluid reservoirs (behind rudder pedals on one side of the cockpit) and remove the inner seal cap.

At the side where there are no fluid reservoirs grab the whole rudder pedal and deflect it back fully, so that it becomes level with the cockpit's floor beneath. Now, at the side where there are fluid reservoirs, jerk brake levers back and forth a couple of times - this will push air bubbles towards the reservoir and out of the lining. When convinced air bubbles are no more, put seal caps back onto the reservoirs and screw the caps on as well. Repeat the procedure for the other brake lever.

WARNING! SHOULD YOU ENCOUNTER ANY DIFFICULTIES DURING THIS PROCEDURE OR THE AIR BUBBLES WOULD NOT VENT, PLEASE CONSULT THE MANUFACTURER OR AUTHORISED SERVICE PERSONNEL FOR FURTHER INSTRUCTIONS.

Schematic of hydraulic brakes' lining

To airbrake handle

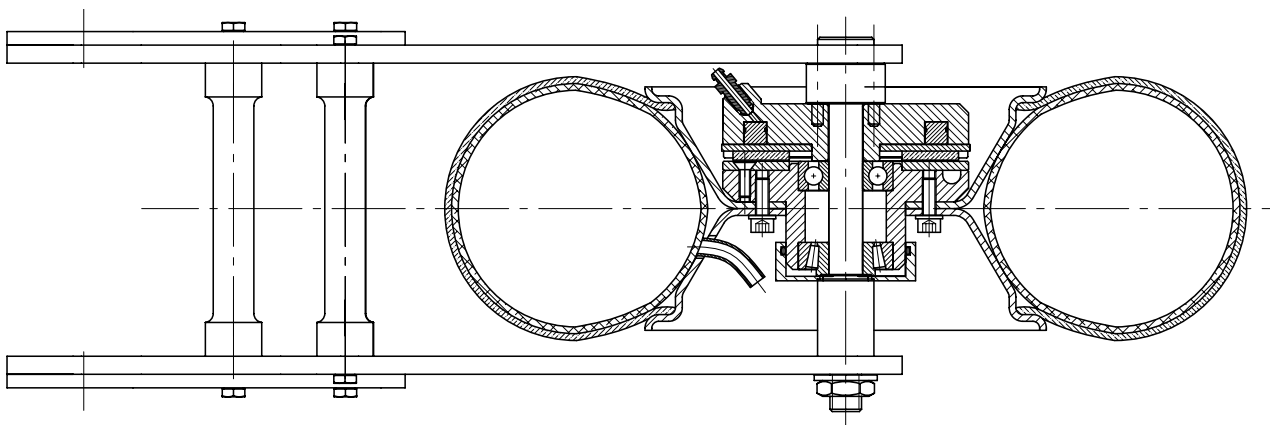


Poor braking action

In case you notice poor braking action even when hydraulic brake levers are depressed fully, it is not necessary the air bubbles in the hydraulic lining, which is causing the problem.

The main wheel's main axis' nut (especially after a wheel and/or axis replacement nut) may be tightened incorrectly so that the brake shims do not make contact with the brake plate. Please consult the manufacturer or authorised service personnel for further information.

Schematic of wheel and wheel brakes



Special check-ups

After having exceeded VNE or landed in a rough manner:

check the undercarriage, fuselage & wing surfaces and main spars for abnormalities. It is highly recommended to have the aircraft verified for airworthiness by authorised service personnel.

Draining and refuelling

Whenever draining or refuelling make sure master switch is set to OFF (key in full left position).

Draining the fuel system

The gascolator is located on the bottom of the fuselage and accessible through the aft cabin. To drain the fuel system, open the drain valve on the gascolator. Drain no more than a couple of spoonfuls of fuel. Try to prevent ground pollution by intercepting the fuel with a canister. To close the valve simply turn it in the opposite direction. **Do not use force or special tools!**

CAUTION! ALWAYS DRAIN THE FUEL SYSTEM BEFORE YOU HAVE MOVED THE AIRCRAFT FROM A STANDSTILL TO PREVENT MIXING OF THE FUEL AND EVENTUAL WATER OR PARTICLES.

Refuelling

CAUTION! BEFORE REFUELLING IT IS NECESSARY TO GROUND THE AIRCRAFT!

Refuel the aircraft by pouring the gasoline through the top-wing fuel reservoir openings or using a pump to do so.

Tie down

Tie down the Taurus using dedicated screw-in rings which attach to the adequate threads on the bottom side of the wing. Alternatively you may also tie down the wings using a rope over the winglets area, however make sure you place a soft piece of foam or equivalent between the wing surface and the rope, not to cause surface and structural damage in case of over-tightening the rope. Tie down the tail by leading the rope over the fuselage just where the vertical tail surface meets the fuselage. Tighten this rope in backwards (45°) direction.

Storage

The aircraft is ideally stored in a hangar. For increased in-hangar manoeuvrability use of original pushcart or free turning tail wheel adapter is recommended.

Even for over-night storage it is recommended to leave the spoilers' (airbrakes') handle unlocked in order to reduce pressure on plate springs and maintain their original stiffness.

As for the parachute rescue system make sure the activation handle safety pin is inserted every time you leave the aircraft.

Also, disconnect the battery from the circuit to prevent battery self-discharge during storage period.

CAUTION! SHOULD THE AIRCRAFT BE STORED AND/OR OPERATED IN AREAS WITH HIGH ATMOSPHERIC HUMIDITY PAY SPECIAL ATTENTION TO EVENTUAL CORROSION OF METAL PARTS, ESPECIALLY INSIDE THE WINGS. UNDER SUCH CIRCUMSTANCES IT IS NECESSARY TO REPLACE THE SPOILERS' (AIRBRAKES') CONNECTOR ROD EVERY 2 YEARS.

CAUTION! MAKE SURE THE CABIN IS CLOSED AND LOCKED EVERYTIME YOU LEAVE THE AIRCRAFT AS OTHERWISE THE FRAME CANOPY FRAME MAY NO LONGER FIT THE FUSELAGE AFTER A WHILE AS PLEXIGLASS AND FIBER HAVE SIGNIFICANTLY DIFFERENT STRETCH COEFFICIENTS.

Cleaning

Use pure water and a soft piece of cloth to clean the aircraft's exterior. If you are unable to remove certain spots, consider using mild detergents. Afterwards, rinse the entire surface thoroughly.

Always use pure water only to clean the glass surfaces, not to damage these protection layers and coatings.

To protect the aircraft's surface (excluding glass surfaces) from the environmental contaminants, use best affordable car wax. (e.g. Sonax Extreme WAX Full Protection no.1)

The interior is to be cleaned with a vacuum cleaner.

Keeping your aircraft in perfect shape

Precautions

- 1) Eliminate the use of ALL aggressive cleaning solutions and organic solvents, also the window cleaning spray, benzene, acetone, aggressive shampoos etc.
- 2) If you must use an organic solvent (acetone) on small areas remove certain glue leftovers or similar, the surface in question MUST be polished thereafter. The only section where polishing should be avoided is the edge on the wing where the sealing gasket is applied.
- 3) When flying in regions with a lot of bugs in the air, you should protect the leading edges of the airframe before flight (propeller, wings, tail) with Antistatic furniture spray cleaner: "Pronto (transparent), manufacturer: Johnson Wax (or anything equivalent) – Worldwide", approximate price is only \$3 USD / €3 EUR for a 300 ml spray bottle. Using such spray, do not apply it directly onto the wing but into a soft cloth instead (old T-shirts are best).
- 4) After having finished with flight activity for the day, clean the leading edges of the airframe as soon as possible with a lot of water and a drying towel (chamois, artificial leather skin). This will be very easy to do if you applied a coat of Pronto before flight.

Detailed handling (Airframe cleaning instructions)

Every-day care after flight

Bugs, which represent the most of the dirt to be found on the airframe, are to be removed with clean water and a soft mop (can be also drying towel, chamois, artificial leather skin). To save time, soak all the leading edges of the airframe first. Make sure to wipe ALL of the aircraft's surface until it is completely dry at the end.

Clean the propeller and the areas with eventual greasy spots separately using a mild car shampoo with wax.

CATUION! Do not, under any circumstances attempt to use aggressive cleaning solutions, as you will severely damage the lacquer, which is the only protective layer before the structural laminate.

When using the aircraft in difficult atmospheric conditions (intense sunshine, dusty winds, coastline, acid rains etc.) make sure to clean the outer surface even more thoroughly.

If you notice you cannot remove the bug-spots from the leading edges of the aircraft, this means the lacquer is not protected any more, therefore it is necessary to polish these surfaces.

CAUTION! Do not, under any circumstances attempt to remove such bug-spots with abrasive sponges and/or rough polishing pastes.

Periodical cleaning of all outer surfaces with car shampoo

Clean as you would clean your car starting at the top and working your way downwards using a soft sponge. Be careful not to use a sponge that was contaminated with particles e.g. bud, fine sand) not to grind the surface. While cleaning, do soak the surface and the sponge many, many times. Use a separate sponge to clean the bottom fuselage, as it is usually more greasy than the rest of the airframe. When pouring water over the airframe, be careful not to direct it over the fuel reservoir caps, wing-fuselage joining section, parachute rescue system straps and cover, pitot tube, tail static probe and engine covers.

Always water the shampooed surfaces again before they become dry! Thereafter, wipe the whole of the aircraft dry using a drying towel, chamois or artificial leather skin.

Also, clean the Mylar wing and tail control surfaces gaskets. Lift the gaskets gently and insert ONE layer of cloth underneath, then move along the whole span of the gasket. Ultimately, you may wish to apply Teflon grease (in spray) over the area where the gaskets touch the control surfaces.

Polishing by hand

Use only the highest quality polishing pastes WITHOUT abrasive grain, such as Sonax Extreme no.1 or similar. Start polishing on a clean, dry and cool surface, never in the sunshine!

Machine polishing requires more skills and has its own particularities, therefore it is recommended to leave it to a professional.

Cleaning the Plexy-glass transparent surfaces

It is most important to use really clean water (no cleaning solutions are necessary) and a really clean drying towel (always use a separate towel ONLY for the glass surfaces). Should the glass surfaces be dusty, remove the dust first by purging water (not spraying!) and gliding your hand over the surface. Using the drying towel, simply glide it over the surface, then squeeze it and soak it before touching the glass again. If there are bugs on the windshield, soak them with plenty of water first, so less wiping is necessary. Ultimately, dry the whole surface and apply JT Plexus Spray (\$10 USD / €10 EUR per spray) or at least Pronto antistatic (transparent) spray and wipe clean with a separate soft cotton cloth."

Appendix



Conversion tables

Preflight check-up pictures

**Taurus ultralight
motorglider checklist**

Conversion tables

kilometers per hour (km/h) - knots (kts) - metres per sec. (m/s)

km/h	kts	m/s	km/h	kts	m/s	km/h	kts	m/s
1,853	1	0,37	63,00	34	18,34	124,16	67	36,15
3,706	2	1,07	64,86	35	18,88	126,01	68	36,69
5,560	3	1,61	66,71	36	19,42	127,87	69	37,23
7,413	4	2,15	68,56	37	19,96	129,72	70	37,77
9,266	5	2,69	70,42	38	20,50	131,57	71	38,31
11,11	6	3,23	72,27	39	21,04	133,43	72	38,86
12,97	7	3,77	74,12	40	21,58	135,28	73	39,39
14,82	8	4,31	75,98	41	22,12	137,13	74	39,93
16,67	9	4,85	77,83	42	22,66	138,99	75	40,47
18,53	10	5,39	79,68	43	23,20	140,84	76	41,01
20,38	11	5,93	81,54	44	23,74	142,69	77	41,54
22,23	12	6,47	83,39	45	24,28	144,55	78	42,08
24,09	13	7,01	85,24	46	24,82	146,40	79	42,62
25,94	14	7,55	87,10	47	25,36	148,25	80	43,16
27,79	15	8,09	88,95	48	25,90	150,10	81	43,70
29,65	16	8,63	90,80	49	26,44	151,96	82	44,24
31,50	17	9,17	92,66	50	26,98	153,81	83	44,78
33,35	18	9,71	94,51	51	27,52	155,66	84	45,32
35,21	19	10,25	96,36	52	28,05	157,52	85	45,86
37,06	20	10,79	98,22	53	28,59	159,37	86	46,40
38,91	21	11,33	100,07	54	29,13	161,22	87	46,94
40,77	22	11,81	101,92	55	29,67	163,08	88	47,48
42,62	23	12,41	103,77	56	30,21	164,93	89	48,02
44,47	24	12,95	105,63	57	30,75	166,78	90	48,56
46,33	25	13,49	107,48	58	31,29	168,64	91	49,10
48,18	26	14,03	109,33	59	31,83	170,49	92	49,64
50,03	27	14,56	111,19	60	32,37	172,34	93	50,18
51,80	28	15,10	113,04	61	32,91	174,20	94	50,72
53,74	29	15,64	114,89	62	33,45	176,05	95	51,26
55,59	30	16,18	116,75	63	33,99	177,90	96	51,80
57,44	31	16,72	118,60	64	34,53	179,76	97	52,34
59,30	32	17,26	120,45	65	35,07	181,61	98	52,88
61,15	33	17,80	122,31	66	35,61	183,46	99	53,42

knots (kts) - metres per second (m/s)

	0	1	2	3	4	5	6	7	8	9
0	0	0,51	1,02	1,54	2,05	2,57	3,08	3,60	4,11	4,63
10	0,51	5,65	6,17	6,66	7,20	7,71	8,23	8,74	9,26	9,77
20	10,28	10,80	11,31	11,83	12,34	12,86	13,37	13,89	14,40	14,91
30	25,43	15,94	16,46	16,97	17,49	18,00	18,52	19,03	19,54	20,06
40	20,57	21,09	21,60	22,12	22,63	23,15	23,66	24,17	24,69	25,20
50	25,72	26,23	26,75	27,26	27,76	28,29	28,80	29,32	29,83	30,35
60	30,86	31,38	31,89	32,41	32,92	33,43	33,95	34,46	34,98	35,49
70	36,00	36,52	37,04	37,55	38,06	38,58	39,09	39,61	40,12	40,64
80	41,15	41,67	42,18	42,69	43,21	43,72	44,24	44,75	45,27	45,78
90	46,30	46,81	47,32	47,84	48,35	48,87	49,38	49,90	50,41	50,90

metres per second (m/s) - feet per minute (100 ft/min)

m/sec.		100 ft/min	m/sec.		100 ft/min	m/sec.		100 ft/min
0,50	1	1,96	10,66	21	41,33	20,82	41	80,70
1,01	2	3,93	11,17	22	43,30	21,33	42	82,67
1,52	3	5,90	11,68	23	45,27	21,84	43	84,64
2,03	4	7,87	12,19	24	47,24	22,35	44	86,61
2,54	5	9,84	12,75	25	49,21	22,86	45	88,58
3,04	6	11,81	13,20	26	51,18	23,36	46	90,53
3,55	7	13,78	13,71	27	53,15	23,87	47	92,52
4,06	8	15,74	14,22	28	55,11	24,38	48	94,48
4,57	9	17,71	14,73	29	57,08	24,89	49	96,45
5,08	10	19,68	15,24	30	59,05	25,45	50	98,42
5,58	11	21,65	15,74	31	61,02	25,90	51	100,4
6,09	12	23,62	16,25	32	62,92	26,41	52	102,3
6,60	13	25,51	16,76	33	64,96	26,92	53	104,3
7,11	14	27,55	17,27	34	66,92	27,43	54	106,2
7,62	15	29,52	17,78	35	68,89	27,94	55	108,2
8,12	16	31,49	18,28	36	70,86	28,44	56	110,2
8,63	17	33,46	18,79	37	72,83	28,95	57	112,2
9,14	18	35,43	19,30	38	74,80	29,46	58	114,1
9,65	19	37,40	19,81	39	76,77	29,97	59	116,1
10,16	20	39,37	20,32	40	78,74	30,48	60	118,1

ICAN (international comitee for air navigation) temperatures, relative pressure, relative density and CAS to TAS correction factors as related to altitude

Altitude		Temperature		Relative pressure	Relative density	Cor. factors
feet	metres	°C	°F			
-2.000	-610	18,96	66,13	1,074	1,059	0,971
-1	-305	16,98	62,56	1,036	1,029	0,985
0	0	15	59	1	1	1
1.000	305	13,01	55,43	0,964	0,971	1,014
2.000	610	11,03	51,86	0,929	0,942	1,029
3.000	914	9,056	48,30	0,896	0,915	1,045
4.000	1219	7,075	44,73	0,863	0,888	1,061
5.000	1524	5,094	41,16	0,832	0,861	1,077
6.000	1829	3,113	37,60	0,801	0,835	1,090
7.000	2134	1,132	34,03	0,771	0,810	1,110
8.000	2438	-0,850	30,47	0,742	0,785	1,128
9.000	2743	-2,831	26,90	0,714	0,761	1,145
10.000	3090	-4,812	23,33	0,687	0,738	1,163
11.000	3353	-6,793	19,77	0,661	0,715	1,182
12.000	3658	-8,774	16,20	0,635	0,693	1,201
13.000	3916	-10,75	12,64	0,611	0,671	1,220
14.000	4267	-12,73	9,074	0,587	0,649	1,240
15.000	4572	-14,71	5,507	0,564	0,629	1,260
16.000	4877	-16,69	1,941	0,541	0,608	1,281
17.000	5182	-18,68	-1,625	0,520	0,589	1,302

metres (m) to feet (ft) conversion table

metres (m)		feet (ft)	metres (m)		feet (ft)	metres (m)		feet (ft)
0,304	1	3,280	10,36	34	111,5	20,42	67	219,81
0,609	2	6,562	10,66	35	114,8	20,72	68	223,09
0,914	3	9,843	10,97	36	118,1	21,03	69	226,37
1,219	4	13,12	11,27	37	121,3	21,33	70	229,65
1,524	5	16,40	11,58	38	124,6	21,64	71	232,94
1,828	6	19,68	11,88	39	127,9	21,91	72	236,22
2,133	7	22,96	12,19	40	131,2	22,25	73	239,50
2,438	8	26,24	12,49	41	134,5	22,55	74	242,78
2,743	9	29,52	12,80	42	137,7	22,86	75	246,06
3,048	10	32,80	13,10	43	141,1	23,16	76	249,34
3,352	11	36,08	13,41	44	144,3	23,46	77	252,62
3,657	12	39,37	13,71	45	147,6	23,77	78	255,90
3,962	13	42,65	14,02	46	150,9	24,07	79	259,18
4,267	14	45,93	14,32	47	154,1	24,38	80	262,46
4,572	15	49,21	14,63	48	157,4	24,68	81	265,74
4,876	16	52,49	14,93	49	160,7	24,99	82	269,02
5,181	17	55,77	15,24	50	164,1	25,29	83	272,31
5,48	18	59,05	15,54	51	167,3	25,60	84	275,59
5,791	19	62,33	15,84	52	170,6	25,90	85	278,87
6,096	20	65,61	16,15	53	173,8	26,21	86	282,15
6,400	21	68,89	16,45	54	177,1	26,51	87	285,43
6,705	22	72,17	16,76	55	180,4	26,82	88	288,71
7,010	23	75,45	17,06	56	183,7	27,12	89	291,99
7,310	24	78,74	17,37	57	187,0	27,43	90	295,27
7,620	25	82,02	17,67	58	190,2	27,73	91	298,55
7,948	26	85,30	17,98	59	193,5	28,04	92	301,83
8,220	27	88,58	18,28	60	196,8	28,34	93	305,11
8,530	28	91,86	18,59	61	200,1	28,65	94	308,39
8,830	29	95,14	18,89	62	203,4	28,90	95	311,68
9,144	30	98,42	19,20	63	206,6	29,26	96	314,96
9,448	31	101,7	19,50	64	209,9	29,56	97	318,24
9,750	32	104,9	19,81	65	213,2	29,87	98	321,52
10,05	33	108,2	20,12	66	216,5	30,17	99	324,80

air pressure as related to altitude

altitude (m)	pressure (hPa)	pressure (inch Hg)	altitude (m)	pressure (hPa)	pressure (inch Hg)
-1000	1139,3	33,6	1300	866,5	25,6
-950	1132,8	33,5	1350	861,2	25,4
-900	1126,2	33,3	1400	855,9	25,3
-850	1119,7	33,1	1450	850,7	25,1
-800	1113,2	32,9	1500	845,5	25,0
-750	1106,7	32,7	1550	840,3	24,8
-700	1100,3	32,5	1600	835,2	24,7
-650	1093,8	32,3	1650	830	24,5
-600	1087,5	32,1	1700	824,9	24,4
-550	1081,1	31,9	1750	819,9	24,2
-500	1074,3	31,7	1800	814,8	24,1
-450	1068,5	31,6	1850	809,8	23,9
-400	1062,3	31,4	1900	804,8	23,8
-350	1056,0	31,2	1950	799,8	23,6
-300	1049,8	31,0	2000	794,9	23,5
-250	1043,7	30,8	2050	790,0	23,3
-200	1037,5	30,6	2100	785,1	23,2
-150	1031,4	30,5	2150	780,2	23,0
-100	1025,3	30,3	2200	775,3	22,9
-50	1019,3	30,1	2250	770,5	22,8
0	1013,3	29,9	2300	165,7	22,6
50	1007,3	29,7	2350	760,9	22,5
100	1001,3	29,6	2400	756,2	22,3
150	995,4	29,4	2450	751,4	22,2
200	989,4	29,2	2500	746,7	22,1
250	983,6	29,0	2550	742,1	21,9
300	977,7	28,9	2600	737,4	21,8
350	971,9	28,7	2650	732,8	21,6
400	966,1	28,5	2700	728,2	21,5
450	960,3	28,4	2750	723,6	21,4
500	954,6	28,2	2800	719	21,2
550	948,9	28,0	2850	714,5	21,1
600	943,2	27,9	2900	709,9	21,0
650	937,5	27,7	2950	705,5	20,8
700	931,9	27,5	3000	701,0	20,7
750	926,3	27,4	3050	696,5	20,6
800	920,0	27,2	3100	692,1	20,4
850	915,2	27,0	3150	687,7	20,3
900	909,0	26,9	3200	683,3	20,2
950	904,2	26,7	3250	679,0	20,1
1000	898,7	26,5	3300	674,6	19,9
1050	893,3	26,4	3350	670,3	19,8

ICAO standard atmosphere

h (m)	h (ft)	T (°C)	T (°K)	T/T ₀	P (mmHg)	P (kg/m ²)	p/p ₀	ρ (kgs ³ /m ³)	g (kg/m ⁴)	d	l/S d	V _s	n*10 ⁶ (m ² /s)
-1000	-3281	21,5	294,5	1,022	854,6	11619	1,124	0,137	1,347	1,099	0,957	344,2	13,4
-900	-2953	20,8	293,8	1,020	844,7	11484	1,111	0,136	1,335	1,089	0,958	343,9	13,5
-800	-2625	20,2	293,2	1,018	835	11351	1,098	0,134	1,322	1,079	0,962	343,5	13,6
-700	-2297	19,5	292,5	1,015	825,3	11220	1,085	0,133	1,310	1,069	0,967	343,1	13,7
-600	-1969	18,9	291,9	1,013	815,7	11090	1,073	0,132	1,297	1,058	0,971	342,7	13,8
-500	-1640	18,2	291,2	1,011	806,2	10960	1,060	0,131	1,285	1,048	0,976	342,4	13,9
400	-1312	17,6	290,6	1,009	796,8	10832	1,048	0,129	1,273	1,039	0,981	342	14,0
300	-984	16,9	289,9	1,006	787,4	10705	1,036	0,128	1,261	1,029	0,985	341,6	14,1
200	-656	16,3	289,3	1,004	779,2	10580	1,024	0,127	1,249	1,019	0,990	341,2	14,3
100	-328	15,6	288,6	1,002	769,1	10455	1,011	0,126	1,237	1,009	0,995	340,9	14,4
0	0	15	288	1	760	10332	1	0,125	1,225	1	1	340,5	14,5
100	328	14,3	287,3	0,997	751,0	10210	0,988	0,123	1,213	0,990	1,004	340,1	14,6
200	656	13,7	286,7	0,995	742,2	10089	0,976	0,122	1,202	0,980	1,009	339,7	14,7
300	984	13,0	286,0	0,993	733,4	9970	0,964	0,121	1,191	0,971	1,014	339,3	14,8
400	1312	12,4	285,4	0,991	724,6	9852	0,953	0,120	1,179	0,962	1,019	338,9	14,9
500	1640	11,1	284,7	0,988	716,0	9734	0,942	0,119	1,167	0,952	1,024	338,5	15,1
600	1969	11,1	284,1	0,986	707,4	9617	0,930	0,117	1,156	0,943	1,029	338,1	15,2
700	2297	10,4	283,4	0,984	699,0	9503	0,919	0,116	1,145	0,934	1,034	337,8	15,3
800	2625	9,8	282,8	0,981	690,6	9389	0,908	0,115	1,134	0,925	1,039	337,4	15,4
900	2953	9,1	282,1	0,979	682,3	9276	0,897	0,114	1,123	0,916	1,044	337	15,5
1000	3281	8,5	281,5	0,977	674,1	9165	0,887	0,113	1,112	0,907	1,049	336,6	15,7
1100	3609	7,8	280,8	0,975	665,9	9053	0,876	0,112	1,101	0,898	1,055	336,2	15,8
1200	3937	7,2	280,2	0,972	657,9	8944	0,865	0,111	1,090	0,889	1,060	335,8	15,9
1300	4265	6,5	279,5	0,970	649,9	8835	0,855	0,110	1,079	0,880	1,065	335,4	16,0
1400	4593	5,9	278,9	0,968	642,0	8728	0,844	0,109	1,069	0,872	1,070	335	16,2
1500	4921	5,2	278,2	0,966	634,2	8621	0,834	0,107	1,058	0,863	1,076	334,7	16,3
1600	5249	4,6	277,6	0,963	626,4	8516	0,824	0,106	1,048	0,855	1,081	334,3	16,4
1700	5577	3,9	276,9	0,961	618,7	8412	0,814	0,106	1,037	0,846	1,086	333,9	16,6
1800	5905	3,3	276,3	0,959	611,2	8309	0,804	0,104	1,027	0,838	1,092	333,5	16,7
1900	6234	2,6	275,6	0,957	603,7	8207	0,794	0,103	1,017	0,829	1,097	333,1	16,9
2000	6562	2	275	0,954	596,2	8106	0,784	0,102	1,006	0,821	1,103	332,7	17,0
2100	6890	1,3	274,3	0,952	588,8	8005	0,774	0,101	0,996	0,813	1,108	332,3	17,1
2200	7218	0,7	273,7	0,950	581,5	7906	0,765	0,100	0,986	0,805	1,114	331,9	17,3
2300	7546	0,0	273,0	0,948	574,3	7808	0,755	0,099	0,976	0,797	1,120	331,5	17,4
2400	7874	-0,6	272,4	0,945	576,2	7710	0,746	0,098	0,967	0,789	1,125	331,1	17,6
2500	8202	-1,2	271,7	0,943	560,1	7614	0,736	0,097	0,957	0,781	1,131	330,7	17,7
2600	8530	-1,9	271,1	0,941	553,1	7519	0,727	0,096	0,947	0,773	1,137	330,3	17,9
2700	8858	-2,5	270,4	0,939	546,1	7425	0,718	0,095	0,937	0,765	1,143	329,9	18,0
2800	9186	-3,2	269,8	0,936	539,3	7332	0,709	0,094	0,928	0,757	1,149	329,6	18,2
2900	9514	-3,8	269,1	0,934	532,5	7239	0,700	0,093	0,918	0,749	1,154	329,2	18,3

Cockpit

①



Cockpit aft

②



Canopy, Balance weight

②



④

Nose, Pitot tube, Ventilation

③



Wing root

⑤



Undercarriage, RH wheel

⑤



Starboard wing - leading edge

⑥



Starboard wingtip

7



Starboard wing - trailing edge

8



Starboard airbrake

9



Wing root

10



Propulsion system

10



Engine bay door

11



Horizontal tail surfaces

12



Vertical tail surfaces

13





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Taurus ultralight motorglider checklist

Before start-up

Fuel system drain	PERFORMED
Canopy	CLOSED and LOCKED
Rudder pedals & head rest position	SET
Seat belts	FASTENED
Parachure rescue system safety pin	REMOVED
Brakes	SET
Flaps	2 nd POSITION
Master switch	ON
Propulsion unit	EXTENDED (UP)
Instruments	CHECKED
COM, NAV	SET

Engine start-up

Area around propeller	CLEAR
Fuel valves (if present)	BOTH OPEN
Throttle	1/2
Primer	AS NEEDED
Master switch	VERIFY ON
Ignition	VERIFY ON
Starter button	ENGAGE

After start-up

Warm up at	2500 / 3500 RPM
Magneto RPM drop	VERIFIED
Engine & Propeller check	RPM within limits

Before takeoff

Fuel valves (if present)	BOTH OPEN
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Spoilers

Canopy	CLOSED and LOCKED	RETRACTED
Flight controls	CHECKED	
Flaps	T POSITION	
Elevator trim	FREE	
Control stick	FULL AFT POSITION BEFORE FULL POWER	

After takeoff

Elevator trim	SET
Flaps	UP (0°)

Descent - Approach

Propulsion unit	RETRACTED (DOWN)
Flaps	T POSITION
Instruments	SET
Spoilers	AS DESIRED

Landing

Flaps	L POSITION
Spoilers	AS DESIRED

Shutdown

Brakes	SET
Flaps	UP
Ignition	OFF
Master switch	OFF
Fuel valves (if present)	CLOSED
Canopy	CLOSED and LOCKED

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Warranty statement

Warranty applies to individual parts and components only.

The warranty does not include costs related to the transport of the product, goods and spare parts as well as costs related to the merchandise' temporary storage. Pipistrel d.o.o. does not offer guarantee for the damage caused by every day use of the product or goods. Pipistrel d.o.o. does not guarantee for the lost profit or other financial or non-financial damage to the client, objects or third party individuals .

Warranty voids:

- in case that the customer has not ratified the General Terms of ownership with his/her signature;
- in case the aircraft or the equipment is not used according to the Pipistrel d.o.o.'s instructions or aircraft's manual and eventual supplemental sheets;
- in case when the original additional and/or spare parts are replaced with non-original parts;
- in case additional equipment is built-in without Pipistrel d.o.o.'s prior knowledge;
- in case the purchased goods were changed or modified in any way;
- in case when the defect is caused by user's deficient maintenance, inappropriate care and/or cleaning, user's negligent handling, user's inexperience, due to use of product and/or its individual parts or components in inadequate conditions, due to prolonged use of the product or goods, due to product and/or parts' over-stressing (even for a short duration), due to the fact a repair was not carried out neither by Pipistrel d.o.o. nor by its authorised personnel;
- in case parts that become worn out by every day use (e.g. the covers, pneumatics, electric instruments, electric installation, bonds and bindings, cables, brake plates, capacitors, cooling devices, various pipes, spark-plugs, exhaust systems...)
- the owner must ensure regular engine check-outs and maintenance. Some maintenance works that are demanded by the engine manufacturer must be carried out at Rotax's authorised service centres.

In case the written above is not fulfilled, warranty voids.



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