



INSTRUCTION AND MAINTENANCE HANDBOOK

TRIKE TYPE
RACER 447
RACER 503
RACER 503 SL
RACER 503 S

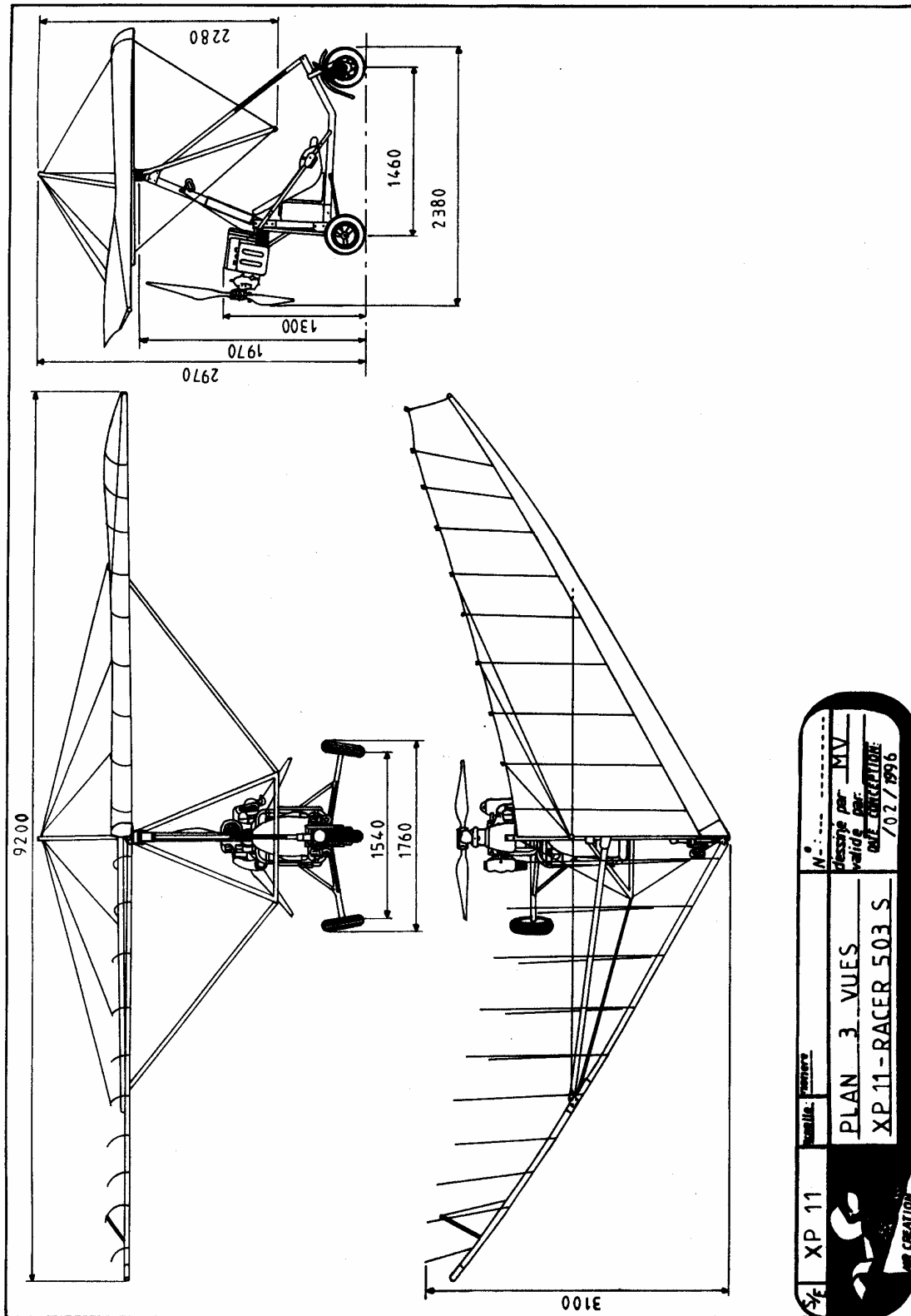
I) Drawings

II) Technical specifications - Performances

III) Instructions for use

IV) Maintenance

I) Drawings



II) Technical Specifications

	RACER 447	RACER 503	RACER 503 SL	RACER 503 S
Empty weight (without options)	66 kg - 146 lbs	71 kg - 157 lbs	71 kg - 157 lbs	71 kg - 157 lbs
Empty weight (standard)	72 kg - 159 lbs	77 kg - 170 lbs	83 kg - 183 lbs	88 kg - 194 lbs
Max weight	212 kg - 468 lbs	212 kg - 468 lbs	212 kg - 468 lbs	212 kg - 468 lbs
Max payload with a monoseater wing	140 kg - 309 lbs	135 kg - 298 lbs	129 kg - 285 lbs	124 kg - 274 lbs
Ultimate load factors at max weight	+6g -3g	+6g -3g	+6g -3g	+6g -3g
Limit load factors	+4g -2g	+4g -2g	+4g -2g	+4g -2g
Fuel tank	23 l (6 US Gal)	23 l (6 US Gal)	23 l (6 US Gal)	38 l (10 US Gal)
Option	38 l (10 US Gal)	38 l (10 US Gal)	38 l (10 US Gal)	
Rotax engine	447	503	503 SL	503 S
Max. power	42 HP	52 HP	52 HP	52 HP
Max. rpm	6800	6800	6800	6800
Reduction gear	Mechanical	Mechanical	Mechanical	Mechanical
Reduction ratio	1/2.58	1/2.58	1/3.47	1/4
Max. propeller rpm	2,600	2,600	2,000	1,700
Measured noise level Lm at max. wt - max. rpm				
- with muffler	74,5 db	76 db	71 db	70 db
- without muffler	76,5 db	78 db		
Corrected noise level Lr		76 db	71 db	70 db
- with muffler	75,8 db	78 db		
- without muffler	77,8 db			
At height H	100 m	110 m	110 m	110 m
Minimum height for noise on ground to be inferior to 65 db at max. rpm	380 m	430 m	200 m	180 m

It follows from the values shown above that the on-the-ground loudness perception value Lh for aircraft flying at height H at maximum weight and rpm may be calculated using the formula

$$L_h = L_r - 22 \log \frac{h}{H}$$

III) Instructions for use

Attention : Due to the low load on the front wheel of the trike, carrying and manoeuvring on the ground without wing must be done carefully in order to prevent any falling on the propeller.

a) Retrofits

The RACER trike can be equipped with any mono seater wing of our manufacture. If the wing to be fitted was not supplied with the trike when purchased (different make or second-hand), make sure that the clearance between the propeller and the rear and keel longitudinal cables is at least 10 cm with the propeller at full pitch.

b) Assembling - Dismantling

- Lift the wing, positioning it on the nose and into the wind.
- Wheel the trike behind the wing and line it up with the keel.
- Raise the upper monopole, run the cable hook onto the wing rail, position the # 10 bolt and install the butterfly nut and the locknut.
- Slip the back-up fastening cable into the belt loop at the king post, running it once around it. Slip it through the belt loop again and fasten it to the trike monopole. The back-up fastening cable should be run under the tensioning cables. This operation secures the trike to the wing, also securing the wing cross-bar tensioning system.
- Place the propeller in an horizontal position.
- Raise the wing nose in an horizontal position.
- Attach the front strut between the aluminium flanges at the top of the upper monopole using the bolt and the butterfly nut.
- Pick up the 'A' frame tubes, take hold of the control bar and lift the wing while keeping the trike from falling over or wing backwards. The front strut can be fitted into the keel opening when the wing is lifted high enough. When alone, sit down on the trike keel facing the 'A' frame, take hold of the control bar, place it on your knees, raise the wing and fit the front strut as indicated.
- First install the upper monopole safety bolt at the engine support using the butterfly and lock nuts, then install the front strut fastening bolt to the lower trike monopole at the fork.
- Install the foam seat upholstery using the Velcro tabs.

Dismantling is carried out in reverse order of the assembling operations.

c) Preflight-check

- Check the wing as indicated in its operating manual.
- Check the trike-to-wing attachments and their back-up devices.
- Check the front strut attachment to the monopole and keel.
- Check the safety bolt on the upper monopole-to-engine support attachment.
- Check propeller, exhaust and exhaust spring fasteners, air filters and silent-block condition.
- Check fuel filter, fuel primer pump, the fuel tank valve, the fuel hose condition and make sure that the hose is well clear of the exhaust.

d) Trike and engine operation

Foot Throttle

The power of the engine increases when pushing the top of the right pedal forward.

Hand throttle

Pushing the throttle lever forward increases power and pulling it back reduces power.

Ground steering

The steering bar operates the front wheel direction. Pushing on the right side will turn the aircraft to the left and vice versa.

Brake

Pushing the top of the left pedal forward operates the brake.

Ignition switch

Down : ON Up : OFF

Fuel cock

Fuel is ON when the lever is set horizontally, in the fuel flow axes.

Fuel is OFF when the lever is pointing vertically, 90° from the hose axes.

– Starting

Fill the tank with a mixture of premium petrol (GB), gas(oline) (U.S.) and 2% synthetic oil for ROTAX engines. (Recommended oil - CASTROL TTS). Open the fuel tank valve.

Use the pump on the fuel hose to prime the engine.

Use the choke when the engine is cold. Place the throttle lever and foot pedal in the "*idle*" position.

Set the ignition switch to "ON".

Ensure that *no one* is standing close to the propeller and pull the starter cord.

Turn the choke down when the engine has been running for a few seconds.

– **Prior to take-off**

Make sure the fuel tank valve is open. Fasten and check seat belts.

ATTENTION : Safety belts should be placed at *hip level* and tightened correctly. The belt loops under the seats are placed such as to ensure correct safety belt positioning. Never remove safety belts from the belt loops under the seats : Safety belts fastened at abdominal level may cause internal lesions in the event of violent shock.

Check cutoff by rapidly switching ON to OFF and back.

On the 503 model, check, after the engine has come up to working temperature, that the two ignitions function correctly by flipping the switch on the engine support (central position = ignition 1 + ignition 2).

– **Take-off**

Use full throttle for a short take off. Throttle back slightly after having climbed 100 m to spare the engine. During normal flying, 3/4 throttle will suffice for take-off and climbing. Only use full power under critical conditions (short take-off runs, obstacles, high-altitude flight). In that case *never reduce or cut the engine* below the 100 m altitude to avoid stalling. For safety reasons, use the throttle lever rather than the foot pedal at take-off for rough terrain.

– **Cruising**

Keep the aircraft level with the throttle between 1/4 and full depending on given airspeed. Avoid repeated and sudden power climbs and dives to prevent sudden engine temperature changes.

– **Landing**

The landing approach is best executed using the throttle pedal and both hands on the control bar. At maximum load, keep the throttle at 1/4 of full power when on finals to facilitate flare-out. Throttle back when the wheels touch the ground.

e) **Emergency Procedures**

– **Power failure on take-off**

Should the power unit fail during take-off, and significant height should not have been gained maintain flying approach speed and land the aircraft straight ahead without attempting a return to the landing field. If time allows, set ignition switch off and fuel cock off.

– **Power failure at altitude**

- If the engine fails for any reason, prepare for and carry out the emergency landing procedure as follows :
- Maintain aircraft control
- Immediately establish the best glide angle speed
- Check for a suitable landing sites. Choose a number of preliminary options.
- Set ignition switch to off.
- Set fuel cock to off.
- Check pilot seat-belt is tight.
- Check wind direction, either by natural indications such as smoke rising or by judging drift of aircraft over the ground.
- Choose the most appropriate landing site.
- Set up an approach as far as possible into wind.
- Remember your aircraft cannot be heard. Check that no one is on the landing site
Finalise your approach, deciding upon the best landing to clear the first fence or other obstacles.
- Use a short landing technique.
- Evacuate the aircraft as quickly as possible.

– **Engine fire :**

- Should an engine fire occur during flight :
- Maintain your flying speed
- Set fuel cock off.
- Set ignition switch off
- Carry out the emergency landing procedures in above.

f) Options

1) Pack Serie I

This option includes the following elements :

- Muffler equipment : supplementary exhaust silencer, intake silencer, gear box Rotax type C, three blades composite propeller.
- Rough terrain and travelling equipment : rear wheels with aluminium hub, front shock absorbers, foam seats.

2) **Pack Serie II**

This option includes the following elements :

- Rear wheel spats.
- Side bags.
- Instrument panel.
- Instruments for engine control.
- 38 liters fuel tank.

Pack II weights 5 kg. It is part of the standard equipment proposed on S series, in addition to Pack I. Useful loads indicated on page 2 of this manuel take into account this pack equipment mounting.

3) **Noise reducer (serial fitted on 503 SL and S)**

Complementary to the integral exhaust muffler, the optional system is installed on the exhaust and the carburettor air intake. The optional muffler slightly reduces maximum power. Muffler weight is 1.7 kg, reducing RACER 447 payload to 138 kg and RACER 503 payload to 133 kg. The RACER 503 S is standard fitted with these muffler.

4) **Rear wheel spats (serial fitted on 503 S)**

Rear wheel spats do not affect aircraft performance. They should be removed, emptied and cleaned after landing on soft ground. Total kit weight is 1.5 kg, reducing RACER 447 maximum payload to 138,5 kg, RACER 503 to 133,5 kg and RACER 503 S to 127,5 kg

5) **Parachute**

Trikes can be equipped with a cartridge-actuated (rocket launched) parachute installed behind the middle beam under the engine. To deploy the parachute, pull the red handle placed between the pilot's legs, on the seat frame. The parachute will allow the occupants and the aircraft to descend safely if a major problem occurs (collision, flight envelope exceeded). If altitude allows, switch off engine before deploying parachute. If not, the engine will be stopped at the same time you pull the handle, due to the additional switch located on the handle fitting. Inspect bridle connection points and activation cable before flying. **WARNING** : do not modify them.

When rigging the wing, wires must be fixed with the link shackle.

The parachute kit does not alter the aircraft flight behaviour but the weight of this option reduces all aircrafts' usefull loads by 9 kg (20 lbs).

6) **Three-bladed propeller (serial fitted on 503 SL and S)**

The three-bladed composite propeller reduces fuel consumption and dampens engine vibration. The pitch is adjustable on the ground. For RACER 447 and 503, a 14° pitch is recommended for flying speed < 100 km/h (FUN 14) and 16° for speed more important (XP 11). This propeller doesn't affect aircraft performance. The maximum allowable propeller speed is 2900 rpm. Recommended RACER 503 S propeller pitch is 24° for a maximum allowable propeller speed of 1,750 rpm. Standard pitch is 27° for the RACER 503 SL Ecoprop propeller, with a maximum speed identical to the one of the 503 S.

7) **Instrument panel (serial fitted on 503 S)**

The console, which is mounted onto the lower trike keel is designed for 7 flight instruments. The fold-away mounting support does not affect the wing mounting procedure described in section II b. RACER payload is reduced by 1.5 kg.

8) **Raid-type flight bags (serial fitted on 503 S)**

The two optional flight bags are installed on either side of the seat frame. Installation does not affect aircraft performance. Empty flight bag weight reduces RACER trike payload by 1 kg.

9) **38-liters fuel tank (serial fitted on 503 SL and S)**

The 38-liters fuel tank increases aircraft range. The option does not affect performances. Payload is reduced by 1 kg.

10) **Towing system (only on 503 S and SL)**

Racer trikes equipped with this system see their useful loads decreased by 2 lbs (1 kg).

It allows streamers, advertising signs and hang glider towing.

Pulling the lever backward, sets in the left lower part of the frame seat, releases the towing cable.

11) **Three points safety belts**

This option gives better occupant protection in case of major accidents or sudden shocks. **Do not unbuckle carelessly as the buckle could strike the propeller.** The 3 points anchored safety belt reduces the useful load of the Racer trikes by 2 lbs (1 kg).

IV) Maintenance

a) Transport

Trikes should preferably be transported on light trailers (please consult us for further details).

b) Storage

The trike unit should be thoroughly checked and cleaned prior to storage. After cleaning, wipe all components with a clean lightly oiled cloth, while avoiding joints and rubberized parts.

If the trike unit is to be stored for a long period (e.g. : over the winter) :

- Place a well oiled cloth in the open end of the exhaust (leaving it obvious).
- Cover the air inlet filters with several layers of protection as a precaution against condensation.
- Drain the fuel tank.

c) Running in

Your trike's engine had been factory tested but requires running-in.

The engine should be run in on the ground as stated in the ROTAX instruction manual.

Except for take-off, avoid using full power for long periods during the first ten hours.

Change gearbox engine oil on completion of first ten hours and re-torque the bolts of the cylinder head.

d) Maintenance

Your trike's engine has been factory-tested but requires running-in. Only operate the aircraft at full power at take-off, and avoid using too much power during the first 10 hours. Consult the ROTAX manual for first-hour operation and maintenance.

NEVER FLY USING A PROPELLER UNBALANCED by shock or impact. Vibrations thus generated will damage the reduction gear and the trike frame. To check propeller balance : Remove the propeller and hang it, free to rotate, by the hub. If balanced, it should remain horizontal. If it does not, it should be returned to the factory for balancing. Never leave a propeller in the vertical position for extended periods of time : the water contained in the wood may unbalance it. Use Talbot Rouge Vallenga TAL 01-146367 spraycan automobile paint for touching up the frame coating where necessary.

Every 10 hours of flight time :

- Change both spark plugs.
- Check trike, engine and propeller nuts. Pay particular attention to front and tail undercarriage wheel locknuts. After removal, tighten and secure using "LOCTITE FREINBLOC".
- Check the exhaust, the silent blocks and the manifold springs.
- Check the air filter and filter/carburettor assembly bolts.
- Check oil level in the reduction gear box, topping up when necessary.
- Check fan belt tension.
- Check the fuel filter for sludge.
- After the first 10 hours of operation, change the oil in the reduction gear box and tighten cylinder head bolts and check setting of ignition.
- Check the propeller.

Every 50 hours of flight time :

- Change the engine and exhaust mounting silent blocks.
- Change the 2 front wheel shock absorbers.
- Change the starter cord.
- Check the monopole where the engine is mounted and around the swivel joint for hairline cracks or play.
- Check seams on welded assemblies and mounting holes for play (engine support, front forks, lower beam, hooking frame point, monopole swivel joint etc.).
- Check engine ignition and contact points.
- Grease throttle cables and check cable stops.
- Clean the air filter.
- Check propeller balance (see III b)

Every 100 flight hours :

- Change gear drive oil.
- Change hoses, fuel filter and fuel primer pump.
- Decoke engine cylinders. Tighten cylinder head bolts.
- Change throttle cables, all bolts involved in frequent mounting/demounting operations (hang point, front strut, etc.), engine and propeller mounting bolts.
- Check tyres, rims and wheel and fork bearings.
- Check engine support, hang point, undercarriage struts and links, wheel shafts and seat seams.
- Check upper and lower mounting connections of compression strut. Remove the upper and lower nylon bases and inspect the tube where it enters the hole for ovalization or cracks.

In the event of heavy landings :

- Check the front forks, remove and inspect the fork pivot and wheel shaft.
- Check the seat frame for distortion. Check seat seams.
- Check the lower beam in particular the welding on the V junction, the upper beam and the compression strut, the swivel joint (play, hairline cracks), the engine support and the engine mounting silent blocks.
- Check the rear wheel assembly, assembly clearances and shock absorber pressure.
- The structure of the wing must be completely inspected in our premises or by an approved technical station after any heavy landing or even for slight damages.

ATTENTION :

Changing all *Nylstop* nuts after loosening is mandatory. Always secure such nuts using LOCTITE glue.

PERIODICAL OVERHAULS BOARD

Serial number :

Date	Hours flown	Company which has carried out the overhaul address and stamp

PERIODICAL OVERHAULS BOARD

Serial number :

Date	Hours flown	Company which has carried out the overhaul address and stamp

Notes

TRIKE - QUALITY FORM

Anxious to ensure the perfection of our products, we have set a sequence of controls covering all the steps of production. We are working continuously on their improvement and we are in need of your help.

Please return this reply form accurately filled if you find any mistake or problem concerning your trike, which could affect its quality or finish, even if it is a minor one.

Your name, address and telephone number :

Type : _____

Delivery date : _____

Trike number : _____

Engine serial number : _____

Distributor : _____

Hours flown : _____

Problems noticed : (explanations and / or drawing)

