

Pilot's Operating Handbook

MERLIN

Manufactured by:
TechProAviation s.r.o.
Czech Republic

Distributed by:
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MERLIN PILOT'S OPERATING HANDBOOK

Airplane type / version: Merlin

Manufacturer: TechProAviation, s.r.o.

Serial nr:

Registration nr:

Date of publication: 4.9.2012

Revised 1.17.2023

The airplane MUST be operated in accordance with this manual.

**This manual must be always available to any person
who is to fly this airplane.**

1. GENERAL

1.1. *Introduction*

This manual is part of each Merlin aircraft. It is designed to convey the necessary information for the operation and maintenance of the airplane.

1.2. *Legal certification base*

This airplane has been designed in compliance with ICAO regulations describing the operations and maintenance of sport flying equipment. ICAO approval and certification have been employed to generate this manual.

UL-2 – Requirements for Airworthiness of sport flying equipment.
Regulation of Light Aircraft Association of Czech Republic.

1.3. **WARNINGS CAUTIONS AND ALERTS**

In this manual are the following warning levels: WARNING, CAUTION, and ALERT:

WARNING: Information about situations that may result in death or airplane destruction.

CAUTION: information about situations that may result in injury or damage to the airplane.

ALERT: Information with significant importance for the pilot and/or maintainer.

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1.4. BASIC AIRPLANE DESCRIPTION

The MERLIN is an all-metal (AL6061-T6), high wing, (European-specification ultralight) airplane. The Merlin fits in the experimental amateur-built (EA-B) class in the USA and numerous other countries.

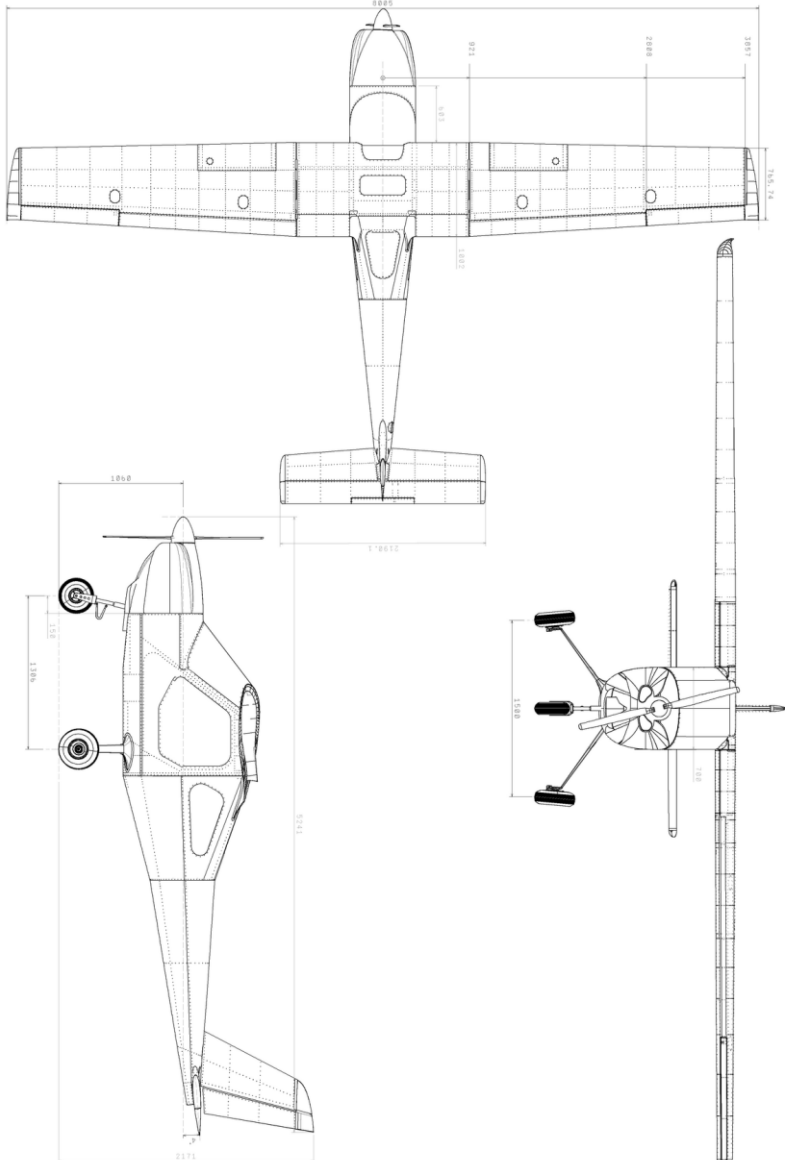
Nonstructural parts typically employ glass fiber composite. The Merlin is equipped with a 60hp Vtwin 4-cycle engine with a 1600mm 3-blade, ground-adjustable, carbon propeller.

Note: Imperial measurements may be rounded.

| | | |
|--------------------------------|--------------------------|----------------|
| Wingspan | 7.8 m | 25' 7" |
| Length | 5.241 m | 17'2" |
| Height | 2.2 m | 7'2" |
| Wing area | 7.1 m² | 23.5' |
| Mean aerodynamic chord | 0.917 m | 3'1" |
| Max. TO weight (no BRS) | 300 kg | 661 lbs |

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THREE VIEW LINE DRAWINGS



2. LIMITS

All given airspeeds in this manual are indicated air speed (IAS). For conversion see calibrating table 5.1

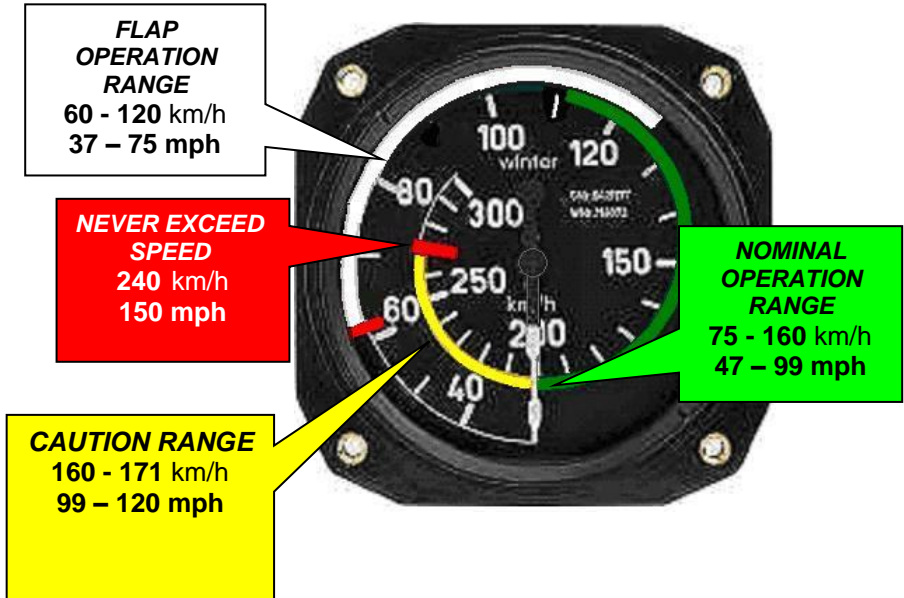
2.1. AIRSPEED LIMITS

| airspeed | | IAS km/h | IAS mph |
|-----------------|-----------------------------------|-------------|------------|
| V _{NE} | Never exceed speed | 240 | 150 |
| V _{NO} | Maximum structural cruise speed | 160 | 99 |
| V _A | Designed maneuvering speed | 150 | 93 |
| V _{RA} | Maximum speed in turbulence | 171 | 106 |
| V _{FE} | Maximum speed with flaps extended | 120 | 75 |
| V _{S1} | Stall speed without flaps | 75 | 47 |
| V _{S0} | Stall speed with flaps | 60 | 37 |

WARNING: Do NOT use large control surface deflection when flying faster than V_A. You may cause overload.

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2.2. AIRSPEED MARKING



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2.3. ENGINE: AEROMARINE VTWIN

GENERAL SPECIFICATIONS:

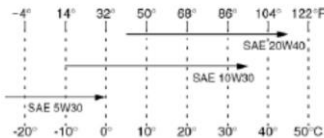
| | |
|-------------------------------------|-----------------------------|
| Max. TO power (HP) | 60 |
| Max. RPM | 8000 RPM |
| Max. RPM Continuous | 6 500 RPM |
| Min. oil pressure | 42 psi/6000rpm |
| Engine oil | 5w 40 |
| Coolant | 50-50 mix water and coolant |
| Operating ambient temperature range | -20°C |
| | + 40°C |

Engine :

| | |
|----------------------|------------------------------------|
| Engine type | Liquid cooled 4-stroke, Water cool |
| Cylinder arrangement | V type twin cylinder |
| Displacement | 800cm3 |
| Bore × stroke | 91 × 61.5mm (3.58×2.42in) |
| Compression ratio | 10:1 |
| Starting system | Electric starter |
| Lubrication system | Wet sump |

Engine oil :

API service SE,SF,SG type or higher



Spark plug

| | | |
|-------------------|------------|------------------|
| Type/manufacturer | DCPR7E / 1 | (NGK) |
| Spark plug gap | 0.8-0.9 mm | (0.031-0.035 in) |

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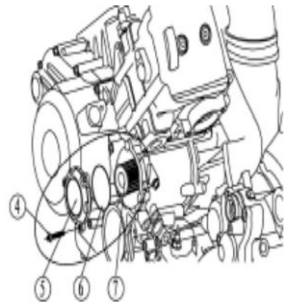
MAINTENANCE SCHEDULE

| ITEM | ROUTINE | Whichever comes first → | EVERY | | | INITIAL | | |
|-----------------------------|--|----------------------------|-------|-------|-------|---------|---------|---------|
| | | | month | 1 | 3 | 6 | 6 | 12 |
| | | | km | 320 | 1,200 | 2,400 | 2,400 | 4,800 |
| | | | (mi) | (200) | (750) | (1,500) | (1,500) | (3,000) |
| | | | hours | 20 | 75 | 150 | 150 | 300 |
| Engine oil | • Replace. (Warm engine before draining.) | | ○ | | ○ | | ○ | |
| Engine oil strainer* | • Clean. | | ○ | ○ | ○ | | ○ | |
| Engine oil filter cartridge | • Replace. | | ○ | ○ | ○ | | ○ | |
| Spark plug | • Check condition. • Adjust gap and clean. • Replace if necessary. | | ○ | ○ | ○ | | ○ | |

CHANGING THE ENGINE OIL

Place the vehicle on a level surface.

1. Start the engine and let it warm up for several minutes.
2. Stop the engine and place an oil pan under the engine.

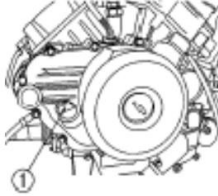


3. Remove cowl

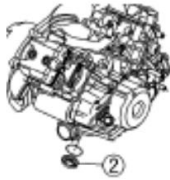
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4. Remove the following parts in this order.

1. Oil Dipstick (1)



2. Oil Drain Bolt (2)



3. Oil filter cover bolts (4) M6 X 20 and cover (5), sealing O-ring(6), And oil filter cartridge (7)

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4. Install a new oil filter cartridge
5. Install the oil drain bolt
6. Fill the engine with the proper amount of engine oil to between the minimum and maximum level on the dipstick.
7. Install the dipstick
8. Run the engine to warm it up.
9. Shut off the engine and allow the engine oil to settle.
10. Recheck the level and adjust as needed.

Look for any leaks

Oil filter may be obtained from a variety of ATV suppliers:

- Fits Hisun UTV/ATV 800 1000 including Hisun, Massimo, Bennche, Yardsport, Coleman, Cub Cadet, TSC
- Fits 2012 CForce 800 ; 2013 CForce 800 UForce 800 ; 2014 CForce 500 H.O., X800 UForce 800 ZForce 800 EX ; 2015 CForce 500 H.O., 800 UForce 500, 800 ZForce 800 Trail, 800; 2016-2021 Cforce 400AU 500S 500 HO 600 800; 2016-2021 Uforce 500 600 Tracker 800 800 EX 1000 EPS; 2016-2021 Zforce 500 Trail 800/Z8-EX SSV 800/Z8 1000/Z1000EX
- OEM Number: 15200-001-0000; 0800-011300; 0800-011300-00030; 0800-011300-0004

Sample:



Oil Filter For Hisun ATV UTV
800
1000,Massimo,Coleman,Benn
he,CFMOTO Cforce Zforce
Uforce 400 500 600 800 900
950 1000

Item Package Quantity:1



COOLING SYSTEM

Use a Ethylene Glycol type antifreeze color green, at a 50/50 diluted mix and add as needed.

2.4. Reduction Drive

Re-tension the V belt after initial installation of a new belt / engine after 5 to 10 hours. Check belt tension every 50 to 60 hours.

Replace the Vbelt every 150 hours.

2.5. WEIGHT LIMITS

The following values are for MERLIN with minimum flight equipment. Because of equipment options, max/min weights for pilot may vary. MTOW and baggage limits must always be observed.

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| | | |
|--------------------|------------|------------|
| Empty weight | 181 kg | 400 lbs |
| Max TO weight | 315 kg | 700 lbs |
| Max pilot weight | up to MTOW | up to MTOW |
| Min pilot weight | 55kg | 121 |
| Max luggage weight | 10 kg | 22 lbs |

WARNING: Make sure not to exceed maximum allowed weight.

2.6. CENTER OF GRAVITY

| | |
|----------------|-----------------|
| Front limit CG | 25 % MAC |
| Rear limit CG | 35 % MAC |

See chapter 6: CG determination.

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2.7. ALLOWED MANEUVERS

Sharp turn (max. bank 60°)

Maximum entry airspeed: 140 km/h : 87 mph

**WARNING: Aerobatics, deliberate stalls, and spins are forbidden.
Max bank angle: 60°**

2.8. maximum "G force" LIMITS

| | | |
|----------------|-------------------------|-----|
| Flaps 0° | Max positive load in CG | + 4 |
| | Max negative load in CG | - 2 |
| Flaps extended | Max positive load in CG | + 2 |
| | Max negative load in CG | 0 |

2.9. PILOT / CREW

The MERLIN is a single seat airplane. The crew is one pilot.

2.10. OPERATION

WARNING: Day VFR flight only.

WARNING: IFR flight, night flying and flying in clouds or icing conditions is prohibited.

2.11. FUEL

2.11.1. APPROVED FUELS

Automobile unleaded gas **Natural 95**

Unleaded UL 94 (SWIFT) or Premium 92 mon fuel recommended

(Standard fuel for gasoline engines, ASTM D 4814 or AVGAS 100 LL)

ALERT: Using AVGAS increases engine fatigue. Use AVGAS only when no other fuel available.

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For more information, see engine manual.

2.11.2. FUEL TANKS CAPACITY

| | | |
|-----------------------------------|--------------|-------------------|
| One wing tank's capacity (usable) | 22.7L | 6.0 gal US |
| Total fuel capacity | 45.4L | 12 gal US |
| One wing unusable fuel | 0.8L | .2 gal US |
| Total unusable fuel | 1.6L | .4 gal US |

2.12. OTHER LIMITS

WARNING: Smoking onboard is prohibited.

| | |
|-----------------------------------|--------------------|
| Max. cross wind | 8 knots (4 m/s) |
| Max. wind in the runway direction | 16 kts (8 m/s) |

| | | |
|------------------|--------|--------|
| Max outside temp | 40° C | 104° F |
| Min outside temp | -20° C | +4° F |

Heavy rain or high humidity may decrease performance. During the flight in high humidity, it is recommended to increase the speed by 6 mph (10km/h).

Flying in slip turns is standard; entry airspeed 62 mph (100km/h). All flap deflections are allowed while in slip turn. *Slip turns are safe only when general rules of pilotage are followed.*

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LABELS

| | | |
|---|-------------------------------|---------------|
| REGISTRATION LABEL of flying sport / ultralight airplane | | |
| Registration #: | | |
| Manufacturer: | TechProAviation s.r.o. | |
| Type/Name: | MERLIN | |
| Seriál nr.: | | |
| Empty weight: | 400 lbs. | 181 kg |
| Max. take off weight: | 700 lbs. | 315 kg |

| MAX CREW WEIGHT (kg) According to luggage and fuel | | | | | | |
|--|--------------------------|-----------|-------------|-------------|-----------|--------------|
| Fuel | Fuel gauge | 100% | 75% | 50% | 25% | 30min flight |
| | Amount of Fuel (kg/litr) | 20/ 25 | 15/ 18,7 | 10/ 12,5 | 5/ 6,2 | 2,5/ 3,1 |
| Luggage | Max: 10 kg | 94 | 104 | 114 | 124 | 129 |
| | ½: 5 kg | 99 | 109 | 119 | 129 | 134 |
| | None: 0 kg | 104 | 114 | 124 | 134 | 139 |

This product is under compliance with the LAA, Czech Republic and is operated under the Pilot's sole risk and responsibility.

Aerobatics, deliberate stalls, and spins are forbidden.

ENGINE RPM

Max RPM **8000**
 Max continuous RPM **6 500**
 Idle RPM **1250 +- 50**

6 Gallons
UL 94
Autogas 92 mon

Luggage
max.
10 kg

Luggage
max.
22 lbs

pneu 180 +20 kPa

Tire Pressure 26-29 psi

3. EMERGENCY PROCEDURES

This chapter recommends procedures how to solve non-standard situations during operating flying sport equipment.

Emergency situations due to failure of airplane are highly improbable, if operated as described in user manual and regular technical inspections are performed.

3.1. ENGINE FAILURE AND EMERGENCY LANDING

3.1.1. FAILURE DURING TAXIING

- throttle idle
- ignition off
- main switch off
- brakes as needed

3.1.2. FAILURE DURING TAKE OFF

- airspeed - **68 mph - 110 km/h**
- choose place for landing
 - below 150 ft AGL: straight ahead, if possible
 - above 150 ft: any suitable, runway if possible
- ignition - off
- fuel valve - closed
- flaps - retracted, trim
- main switch - off
- safety belt - tighten
- brakes - after touch down as needed

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3.1.3. MIDAIR ENGINE FAILURE

- airspeed climb to reduce to **68 mph - 110 km/h**
- trim to maintain 68 mph - 110 km/h
- flaps as needed **on landing approach**
- turn to landing site

Make sure that ignition, main switch, and fuel valves are in ON position. Continue with midair engine restart procedure as instructed in section 3.2 or continue with emergency landing – section 3.1.2.

3.1.4. FUEL INJECTION AND ICING

- airspeed as needed, min 75 mph – 120 km/h
- throttle change throttle setting to stop the icing
- leave the icing area if possible
- after 90 seconds increase throttle up to cruise setting
- if the thrust does not increase and go for landing on nearest airfield; for more see 3.1.2
- if situation deteriorates, land at first available suitable site

3.2. MIDAIR ENGINE RESTART

- airspeed **80 mph - 130 km/h**
- main switch on
- fuel valve open
- throttle 1/3
- ignition on
- starter start

If the battery is weak, increase speed up to 93-106 mph - 150-170 km/h to spin the propeller.

WARNING: Typical altitude loss for air start is 600 ft.

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3.2.1. ENGINE FIRE ON GROUND

- fuel valve closed
- throttle full
- ignition off
- main switch off
- leave the cockpit and use the fire extinguisher if possible
- fire damage inspection

WARNING: Inspect the airplane for damage and determine the cause of fire before flying again.

3.2.2. MIDAIR ENGINE FIRE NEAR AIRFIELD

- throttle idle
- fuel valve closed
- near airfield maintain **72 mph - 115 km/h** and attempt straight-in landing.
- brakes as needed to full stop

After stop:

- ignition off
- leave the cockpit and use the fire extinguisher if possible

3.2.3. MIDAIR ENGINE FIRE—AWAY FROM AIRFIELD

- fuel valve closed
- throttle full
- airspeed increase – try to “blow out” the fire, **do not exceed V_{NE} !**
- place for landing suitable landing site
- ignition off
- airspeed 68 mph - 110km/h
- flaps as needed, trim for 68 mph - 110km/h
- main switch off
- safety belts tighten
- perform emergency landing
- leave the cockpit and use the fire extinguisher if possible

WARNING: Do not restart engine.

WARNING: Inspect the airplane for damage and determine the cause of fire before flying again.

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3.2.4. ELECTRICAL FIRE IN COCKPIT

- open fully all ventilation, partly open the doors if possible
- turn off all instruments (lights, radio,...)
- land immediately

3.3. GLIDE

| | |
|--|-------------------------|
| Optimum speed for max glide ratio | 58 mph - 94 km/h |
| Max glide ratio | 13-1 |

3.4. FORCED EMERGENCY LANDING

- choose suitable landing site, consider surface (bumps, obstacles)
- consider the wind (strength, heading)
- perform fly by at 75 mph - 120km/h, one notch of flaps, fly at 150 ft, re-consider chosen site
- use normal landing procedure

after touch down:

- ignition off
- main switch off
- fuel valve closed
- brakes as needed

3.5. LANDING WITH LOW PRESSURE IN TIRES

Use normal landing approach and procedure. Keep the damaged wheel off the ground as long as possible. Anticipate unbalanced drag and braking.

3.6. LANDING WITH DAMAGED LANDING GEAR

Use normal landing approach and procedure; keep the damaged part of the landing gear off the ground as long as possible.

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Typical loss of altitude to recover horizontal flight after stall: 150-200 ft.

3.11.2. SPIN RECOVERY

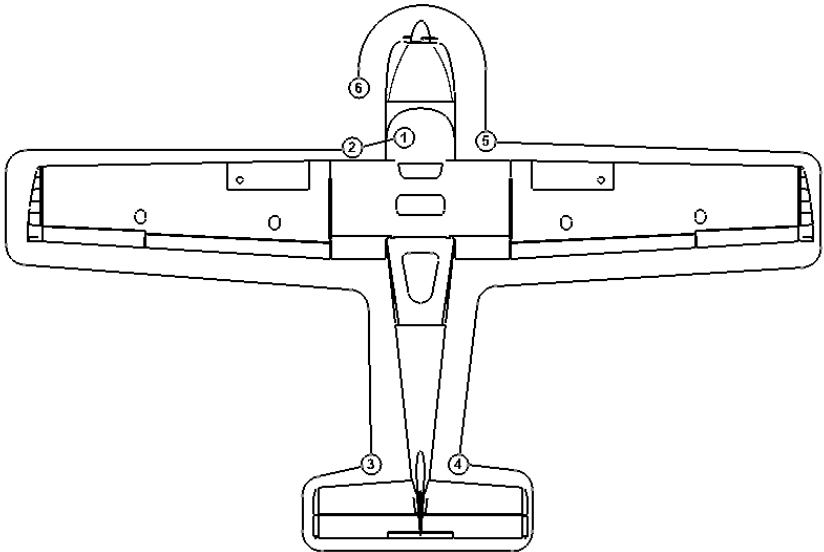
**WARNING: Spin characteristics of this airplane were not tested.
Following procedure is for general information only!**

- throttle idle
- ailerons neutral
- rudder counter the rotation
- elevator push down to recover flying speed; then round out to horizontal

Once the rotation stops, put rudder to neutral position and level the flight.

NORMAL PROCEDURES

3.12. PREFLIGHT CHECK



3.12.1. COCKPIT

- Main switch and ignition - off
- Safety belts - check
- Instruments and equipment - check
- Control stick - freedom of movement
- Rudder pedals - freedom of movement
(Note: rudder control is connected to front wheel steering)
- Flaps - check operation
- Cable steering circuit - freedom of movement, proper tension
- Throttle - freedom of movement
- Brakes - functionality
- Check the condition of plexiglass lock mechanisms.

3.12.2. LANDING GEAR

- Landing gear and brakes - check
- Leg and mounting - check
- Laminate spring (front wheel) - check
- Tire pressure - check

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3.12.3. ENGINE

- Engine and propeller, condition - check
- Pins, safety wires - check
- Engine mount - check
- exhaust pipes - check
- Ignition system - check
- Fuel system - check, purge
- Cooling system - check
- Amount of oil and water - between MIN - MAX lines

3.12.4. WINGS

- Surface and tips - check, look for damage
- Flaps – surface, hinges - check
- Ailerons – surface, hinges - check freedom of movement, deflections
- Fuel tank leaks - check
- Remove pitot-tube cover

3.12.5. FUSELAGE AND EMPENNAGE

- Surface of empennage - check, look for damage
- Rudder and elevator - check freedom of movement, deflection
- Trim - check
- Surface of fuselage - check, look for damage

3.13. ENGINE START PROCEDURE

- pre-flight check done
- safety belt on and secure
- instruments check readings; set correct readings
- cockpit door closed and secured
- main switch on
- fuel valve On fullest tank
- throttle idle
- control stick pull down position
- brakes full brakes
- propeller area clear
- ignition on
- starter on (*max 10 sec. continuous, then wait 2 minutes to cool the motor*)

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- after engine start set RPM to lowest smooth rpm
- instruments check indication
(oil press must be in green within **10 sec.**)
- flight instruments and others as needed

While starting a cold engine, rotate the propeller 4-6 revolutions by hand. Make sure to spin in the correct direction.

3.13.1. ENGINE WARM UP AND TEST

- warm the engine up to nominal temp. (see page 2-7)
 - Set **1800 RPM** and keep 2-3 minutes
- check temp and pressure
 - cooling water must not exceed **100°C**
- check maximum power: Red line 8000
 - check idle: **1250 +- 50 rpm**

**CAUTION: The engine test may be performed on airplane, that is secured against movement, the surrounding area must be clear, airplane must be situated against the wind.
Mind the safety of others. Do not run the engine longer than necessary. Let the engine cool before another test.**

3.14. TAXIING

maximum velocity for taxiing is 10 mph - 15 km/h. Always *check the brakes before taxiing.*

3.15. NOMINAL TAKE OFF

- brakes as needed
- trim neutral
- flaps Normal take off position is 20 degrees
- main switch on
- ignition on
- fuel gauges check amount of fuel
- instruments check
- cockpit door closed and secured
- safety belts secure, tighten
- Controls freedom of movement
- runway and airfield

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check any obstacles and other potential hazards
- radio report

increase throttle to max power. Lift nose slightly at 18-25 mph - 30-40km/h. Rotate slightly at **44–50 mph 70-80 km/h** and accelerate up to 56-62 mph - 90-100 km/h. Then climb.

WARNING: Do not take off when the engine does not run smoothly or if the runway is not clear.

- airspeed for climbing 62-68 mph 100-110 km/h
- RPM reduce to max 6500 rpm
- engine instruments check
- flaps retract above 150 ft and before exceeding 75 mph
- trim for flight conditions

3.16. CLIMB

- airspeed 65 mph - 105km/h

3.17. HORIZONTAL FLIGHT

- level the airplane
- RPM **5000 – 6000**
- airspeed as needed
- engine instruments check
- fuel valve switch as needed
- trim for cruise flight

WARNING: Manage the fuel tanks to ensure you will have fuel at all times, under all conditions.

3.18. APPROACH AND LANDING

3.18.1. DESCENT

- throttle as needed
- engine instruments check readings

WARNING: Avoid prolonged operation of the engine at idle, as it can over-cool and lose power, or delay throttle response.

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3.19. DOWNWIND

- | | |
|----------------------|-------------------------------|
| - throttle | set to horizontal flight |
| - airspeed | 75-81 mph 120-130 km/h |
| - engine instruments | check readings |
| - safety belts | tighten |
| - situation | cleared for landing |
| - brakes | check for pressure |

3.20. NORMAL LANDING

3.20.1. BASE LEG

- | | |
|----------------------|---------------------------|
| - throttle | throttle down for descent |
| - airspeed | 62 mph 100 km/h |
| - engine instruments | check readings |
| - flaps | 20 degrees |
| - trim | as desired |
| - situation | cleared for landing |

3.20.2. FINAL

- | | |
|-------------|---|
| - airspeed | 56-62 mph 90-100 km/h |
| - throttle | as needed |
| - flaps | landing position 30 to 40° |
| - trim | as desired |
| - situation | cleared for landing; also check activity alongside runway for potential incursion |

3.20.3. LANDING

At 30ft AGL, throttle down to idle. Maintain 56-62 mph 90-100km/h until the final flare. Always touch down on main landing gear. After touch down keep front wheel airborne as long as possible.

3.20.4. AFTER LANDING

- | | |
|---------------|----------------------------|
| - brakes | as needed |
| - flaps | retract |
| - instruments | shut down when appropriate |

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3.20.5. Engine stop

- throttle cool the engine (throttle to idle)
- instruments switches off
- ignition off
- main switch off
- fuel valve close
- secure the airplane set parking brake; install control lock

3.20.6. POST FLIGHT INSPECTION

Inspect the airplane. Look for traces of oil and coolant, low tires, any possible in-flight or landing/FOD damage

3.21. ABORTED LANDING

- throttle smoothly engage max power
- airspeed minimum **62** mph **100** km/h before climb
- trim as desired
- flaps Take off position
- engine instruments check readings
- flaps retract at 150 ft
- trim as desired
- airspeed **62-68** mph **100-110** km/hod

3.22. MANAGING THE FUEL SYSTEM

There are two integrated fuel tanks in the wings. The fuel flows through hoses to the instrument panel (using an electronic fuel valve) and the engine.

4. PERFORMANCE

These parameters belong to the MERLIN with the Aeromarine Vtwin engine. Maximum take off weight is 315 kg. The pilotage is nominal, outer conditions correspond to those of international standard atmosphere (ISA).

The real performance may vary to those shown below. Performance depends on the pilot's actions, weather, and the airplane's condition.

WARNING: Different pilot skills as well as airplane settings (such as propeller blade angle) may cause significant differences.

4.1. STALL SPEED

Values below belong to the airplane with maximum take off weight 300kg and horizontal flight.

| | Stall speed mph (km/h IAS) |
|-----------------|----------------------------|
| Flaps retracted | 47 mph (75 kph) |
| Flaps 40° | 37 mph (60 kph) |

4.2. TAKE OFF RUN

The length of take off on grass with the Aeromarine Vtwin engine is 160m. (525 ft). Total distance of take off and climb to 50ft is 290m (951 ft). The flaps are set to 20°.

4.3. LANDING DISTANCE

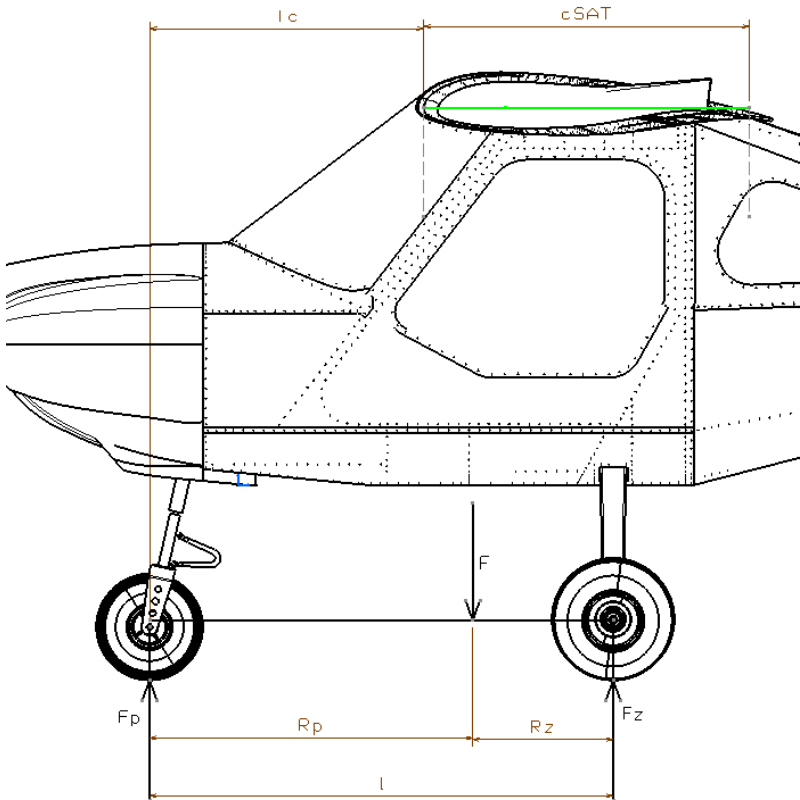
The length of landing (descend from 50ft) is 640m (2100 ft). The Landing run is 180m (591 ft). The conditions are grass, flaps 40°.

4.4. CLIMB RATE

| Altitude | V _{twin} | Airspeed for maximum climb rate (IAS) |
|-----------------------|--|---------------------------------------|
| Sea level Calculation | 1000 fpm - 5 m/s @ 62 mph - 105km/h | |

5. WEIGHT AND BALANCE

5.1. DETERMINATION OF WEIGHT AND BALANCE



When weighing the airplane, the scales are under the wheels. All wheels must have correct dimension (see figure above).

Before taking any measurement check the tire pressure. Also check the airplane stands in level position. The reference plane for levelling is the bottom door frame.

All liquids must be at maximum (oil, brakes, cooling system). The fuel tanks are empty; only the unusable fuel remains.

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The following parameters must be measured:

Weight on the front wheel

Weight on the left main wheel

Weight on the right main wheel

Enter this data into the Excel worksheet provided in the Appendix or downloaded from the Aeromarine Merlin Builders' web page and confirm that the aircraft's CG is within the limits.

This measurement must be done after each construction change.

5.2. Center of Gravity

The correct position of CG is secured when the weight limits of fuel, pilot and luggage weights are as shown in chapter 2.4.

Allowed position of the CG for safe flying is 25-35% C_{MAC}

CAUTION: If nonstandard equipment is installed, it is necessary to calculate actual CG position. It is recommended to support the calculation by measurement as shown above.

6. GROUND HANDLING AND SERVICE

6.1. PARKING AND TIEDOWN

6.1.1. GENERAL

When parking, always secure the airplane against movement. Anchor the airplane in strong wind or if grounded for extended period of time (e.g., over night).

Recommended ground equipment:

- pitot-static protection
- anchoring set
- cover for windows and wings

Exerting any force on the control surfaces is prohibited.

6.1.2. PITOT-STATIC PROTECTION

The pitot-static tube must be protected against foreign objects (dust, insects...) by a cover. The cover must be visible and be clearly marked 'REMOVE BEFORE FLIGHT'

6.1.3. ANCHORING

The minimum recommended set for anchoring the airplane contains:

- 3 anchoring bolts,
- 2 long and 1 short anchoring (tiedown) ropes.

Tie the airplane by stiff and strong points such as the wing tie down rings and/or the landing gear (both front and main legs).

6.2. HANGAR

It is generally easier to push the empty airplane than to pull it in the hangar or tight quarters. Stand alongside the fuselage just in front of the horizontal stabilizer and push down on the fillet between the vertical stabilizer and the fuselage. This unloads the front wheel and allows you to easily steer the airplane.

A helper can push on the leading edge of the wing near the fuselage while moving backwards.

6.3. TOWING

Towing by car is prohibited.

6.4. TIRE PRESSURE

Front wheel - **180+20** kPa / **26.5 - 29** psi

Main wheels - **180+20** kPa / **26.5 - 29** psi

6.5. DISASSEMBLING THE AIRPLANE

6.5.1. WINGS

Removing (or installing) the wings requires 2-3 people.

Before removing the wings, empty the fuel tanks in the wings using the valves on the lower surface of the tanks.

Prepare some holders for the wings. Make sure the holders will not damage the wings (scratches, dents, penetrations...).

Preparing the wings for dismounting:

Remove the cover (aluminum strip between the center wing and the outer wing). Disconnect the pitot-static and fuel hoses. (Make sure to wipe the leaking fuel from the hoses. The fuel must not get into the wings or fuselage.)

Disconnect all the electrical installations at the wing root. Fix the flap to the wing (for example by stretch plastic). Disconnect the eyebolt bearing of the flap.

The aileron control system is accessed in the cockpit, just above the pilot's head. Disconnect the two push/pull tubes from the lever.

Remove the nuts and washers connecting the outer wing with the center section. There are three bolts for each wing: the main spar is connected with two large bolts; the rear spar with a single bolt.

Dismounting:

One person stands at the tip of the wing and slightly pushes upwards to lighten the wing.

Another person removes the bolt from the rear spar, and starts to strike the bolt in the main spar. Use a soft metal striker (soft hammer or a cylinder made of soft metal).

Hit the top bolt first, then the bottom. Keep this pattern until the top of the screw meets the plane of the spar.

At this point the third person should hold the outer wing the root rib. The person at the tip of the wing prepares to hold the weight of the wing.

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While the first person strikes the bolts as before, the second person (at the tip of the wing) makes small movements (2-3cm) up and down, forwards and backwards. This helps to get the bolts out easier.

When the two bolts are out, all the weight (about 15kg) will rest on the two persons (at the tip, at the root).

CAUTION: Always hold the wing at a place where there are rivets, indicating internal supporting structure. Other ways may cause damage.

Put the free wing on the previously-prepared resting place. Be careful of the aileron control tube sticking out of the wing.

For extended period of storage or transportation seal the hoses, lubricate the hinges, and secure the flap and aileron.

6.5.2. HORIZONTAL TAIL UNIT (HTU)

Make sure there is nothing on the tail (tools, cellphones, etc.).

Remove the cover access plate:

- on the top surface just below the rudder

Disconnect the electrical wires to the trim. Just behind the last fuselage rib, disconnect the eyebolt bearing of the elevator's control tube.

Remove four bolts (two in the front and two in the rear mounting hole).

It is convenient to have a helper support the HTU to prevent damage to the mounting bolts.

7. Appendix

- Engine manual
- Inventory of equipment
- Protocol for determining the CG
- Protocol of control surfaces deflections calibration