

2 LIMITATIONS

2.1 General

The limitations section of this manual outlines the various operating limitations, instrument function and placards necessary for the safe operation of this aircraft, engine and standard equipment.

2.2 Airspeed Limitations

2.2.1 With North Wing Mustang 3 19

Speed	MPH	Comments
V _{NE} ---Never Exceed Speed	60 MPH	Never exceed this speed in any operation
V _A --- Max. Maneuvering Speed	50 MPH	Do not make abrupt or full control deflections above this speed
V _{S0} --- Stalling Speed	37 MPH	At max gross weight

2.3 Engine Operating Limitations

2.3.1 Rotax 912UL

Engine Limitations		Metric
ENGINE RPM		
Max RPM	5800 RPM (5 minutes max)	5800 RPM (5 minutes max)
Maximum Continuous RPM	5500 RPM	5500 RPM
Idle RPM	Approximately 1400 RPM	Approximately 1400 RPM
POWER DATA		
Takeoff Performance	81 HP	59.6 KW
Continuous Performance	79 HP	58 KW
OIL PRESSURE		
Maximum Oil Pressure (allowed for short period at cold start)	102 psi	7 bar
Minimum Oil Pressure (below 3500 RPM)	12 psi	0.8 bar
Normal Oil Pressure (above 3500 RPM)	29 – 73 psi	2 – 5 bar
OIL TEMPERATURE		
Maximum Oil Temperature	285° F	140° C
Minimum Oil Temperature	120° F	50° C

(idle at 2000 for 2 minutes and proceed to 2500 RPM till minimum oil temperature is reached)		
Normal Oil Temperature	190 - 230° F	90 - 110° C
CYLINDER HEAD TEMPERATURE		
Maximum CHT	275° F	135° C
Normal CHT	167 - 230° F	75 - 110°C
EXHAUST GAS TEMPERATURE		
Maximum at max. Takeoff Power	1620° F	880° C
Maximum at max. Continuous Power	1560° F	850° C
Normal EGT	1472° F	800° C
FUEL PRESSURE		
Maximum Fuel Pressure	5.8 psi	0.4 bar
Minimum Fuel Pressure	2.2 psi	0.15 bar
AMBIENT OPERATING TEMPERATURE		
Maximum	120° F	50° C
Minimum	-13° F	-25° C

* Only with Rotax exhaust and airbox

2.4 Engine Operating Media

Please refer to your engine Operator's manual section for Operating media approved for your engine.

2.5 Fuel and Oil Capacity

2.5.1 Fuel Capacity

Fuel Capacity	Unusable Fuel Capacity
12 US Gallons or 45 Liters	0.4 US Gallons or 1.5 Liters

2.5.2 Oil Capacity

Oil Capacity
3.17 Quarts or 3 Liters

2.6 Aircraft Operational and Maneuvering Limits

2.6.1 Center of Gravity Limits

Center of gravity limits are not critical in a flex wing weight shift control aircraft. The carriage attaches to the wing through a universal junction known as a hang block

assembly. Variations in cockpit and fuel loading do not affect the wing's balance. The Cygnet is therefore not critical in terms of center of gravity. However, distribution of load in a trike carriage affects the attitude of the trike carriage in-flight in a minor way.

Base Suspension Range (Measured from the leading edge bolts on the nose plate to the hang block suspension point)	Dimension (US)	Dimension (Metric)
North Wing Mustang 3 19	54" – 55"	1372 mm – 1397 mm

2.6.2 Maneuvering Limits and Loads

WARNING

All aerobatic maneuvers including whip stalls, loops, stalled spiral descents, spins and any negative G maneuvers are prohibited

These maneuvers can never be conducted safely. These maneuvers can put the aircraft outside the pilot's control and put both the aircraft and its occupants in extreme danger. Do not pitch nose up or nose down more than 30 degrees from the horizontal. Do not bank more than 60 degrees from level.

Limit	
Maximum Takeoff Weight	1060 pounds (482 Kg)
Maximum Weight in Each Seat	300 pounds (136 Kg)
Minimum Weight in the Front Seat	88 pounds (40 Kg)
Pitch	+30°, -30° from Horizontal
Roll	+60°, -60° angle of bank
Maximum Positive Maneuvering Load Factor	+3.0 G
Negative Maneuvering Load Factors	Prohibited
Load Factors below 1.0 G	To Be Avoided

2.6.3 Pilot In Command (PIC) Seating Location--Front Seat Only

WARNING

The Pilot in Command (PIC) must always occupy the front seat of the aircraft, except for a properly rated CFI providing flight instruction may operate as PIC from the rear seat if he has properly trained the front seat student on all aircraft controls, instruments, switches, and fuses.

WARNING

Always operate the aircraft from the front seat when flying solo.

5.2 Take Off and Landing

5.2.1 Take Off

5.2.1.1 ISA conditions, clean dry runway, calm winds, sea level

Performance at MTOW with 912 UL (80 HP)	Feet	Meters
Take-off distance to 50 ft -- runway	836 ft	255 m
Take-off distance to 50 ft – water	836 ft	255 m

Performance at typical weight of 824 lbs (375 kg) with 912 UL (80 HP)	Feet	Meters
Take-off distance to 50 ft -- runway	586 ft	178 m
Take-off distance to 50 ft – water	586 ft	178 m

5.2.1.2 3000 feet (914 m) density altitude, clean dry runway, calm winds

Performance at MTOW with 912 UL (80 HP)	Feet	Meters
Take-off distance to 50 ft -- runway	1345 ft	410 m
Take-off distance to 50 ft – water	1345 ft	410 m

Performance at typical weight of 824 lbs (375 kg) with 912 UL (80 HP)	Feet	Meters
Take-off distance to 50 ft -- runway	945 ft	288 m
Take-off distance to 50 ft – water	945 ft	288 m

The following factors will increase takeoff distance:

Tail wind

Tall grass on the runway

Higher density altitude

Pilot technique

PIC is required to take into account the effects of these adverse factors while planning a takeoff.

5.2.2 Landing

5.2.2.1 ISA conditions, clean dry runway, calm winds

Performance at MTOW with 912 UL (80 HP)	Feet	Meters
Landing distance from 50 ft onto Land	850 ft	260 m
Landing distance from 50 ft onto Water	700 ft	213 m

Performance at typical weight of 824 lbs (375 kg) with 912 UL (80 HP)	Feet	Meters
Landing distance from 50 ft onto Land	1110 ft	338 m
Landing distance from 50 ft onto Water	1110 ft	338 m

5.2.2.2 3000 feet (914 m) density altitude, clean dry runway, calm winds

Performance at MTOW with 912 UL (80 HP) and	Feet	Meters
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