Pilot Operating Handbook

Revision 1.50

Effective Date:

7/12/2011

Pilot Operating Handbook

This manual must be on the airplane board during operation. This manual contains information which must be provided to the pilot and also contains supplementary information provided.

This aircraft must be operated in compliance with the information and limitations stated in this manual.

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1. Introduction

1.1 Pilot Responsibility

There are inherent risks in participating in aviation activities, these risks are significant, up to and potentially including death. Operators and passengers of recreational aviation aircraft, by participation, accept the risks inherent in such participation of which the ordinary prudent person is or should be aware. Pilots and passengers have a duty to exercise good judgment and act in a responsible manner while using the aircraft and to obey all oral or written warnings, or both, prior to and/or during use of the aircraft.

This Aircraft Operating Instructions has been prepared to provide pilots and instructors with information for safe and efficient operation of the SportStar MAX airplane. It also contains supplementary information considered to be important by the airplane manufacturer.

1.2 Certification basis

SportStar MAX complies with the ASTM F2245-07a Standard Specification for Design and Performance of a Light Sport Airplane, issued by ASTM International Committee F37.
IFR version complies with FAR 91.205 requirements, as well as with F2245 Annex A3 Additional Requirements for Light Sport Airplanes Operated Under Instrument Flight Rules, as known till

1.3 Warnings, Cautions, Notes

The following information applies to warnings, cautions and notes used in the Aircraft Operating Instructions:

WARNING

MEANS THAT NON-OBSERVATIONS OF THE CORRESPONDING PROCEDURE LEADS TO AN IMMEADIATE OR IMPORTENT DEGRADATION OF THE FLIGHT SAFETY.

CAUTION

MEANS THAT NON-OBSERVATIONS OF THE CORRESPONDING PROCEDURE LEADS TO A MINOR OR TO A MORE OR LESS LONG TERM DEGRADATION OF THE FLIGHT SAFETY.

NOTE

Draws the attention to any special item not directly related to safety but which is important or unusual.

1.4 Descriptive data

1.4.1 AIRPLANE DESCRIPTION

SportStar MAX airplane is a metal-composite low-wing monoplane of semimonocoque structure with two side by side seats and steerable nose wheel landing gear.
For further description see Section 7 - Airplane and system description.

1.4.2 POWERPLANT

The standard powerplant consists of ROTAX 912ULS (100 hp) engine and ground adjustable, 3-bladed, WOODCOMP KLASSIC 170/3/R propeller.

IFR version is fitted with certified ROTAX 912S2 engine and ground adjustable, 3-bladed, composite Warpdrive CF prop, with Nickel protection of blade leading edges.
For further description see Section 7 - Airplane and system description.

1.4.3 MAIN TECHNICAL DATA

Wing

Span	28.37 ft
Area	112.7 sq.ft
MAC depth	4.1 ft
Wing loading	11.71 lbs/sq.ft
Aileron area	2.62 sq.ft
Flap area	5.60 sq.ft

Fuselage

Length	19.62 ft
Width	3.55 ft
Height	8.12 ft
Cockpit Max. Width	3.9 ft

Horizontal Stabilizer

Span	8.20 ft
HTU Area	20.88 sq.ft
Elevator area	8.40 sq.ft

Vertical Stabilizer

Height	4.21 ft
VTU Area	10.93 sq.ft
Rudder area	4.67 sq.ft

Landing Gear

Wheel track	6.39 ft
Wheel base	4.43 ft
Wheel diameter	15 in

1.4.1 THREE-VIEW DRAWING

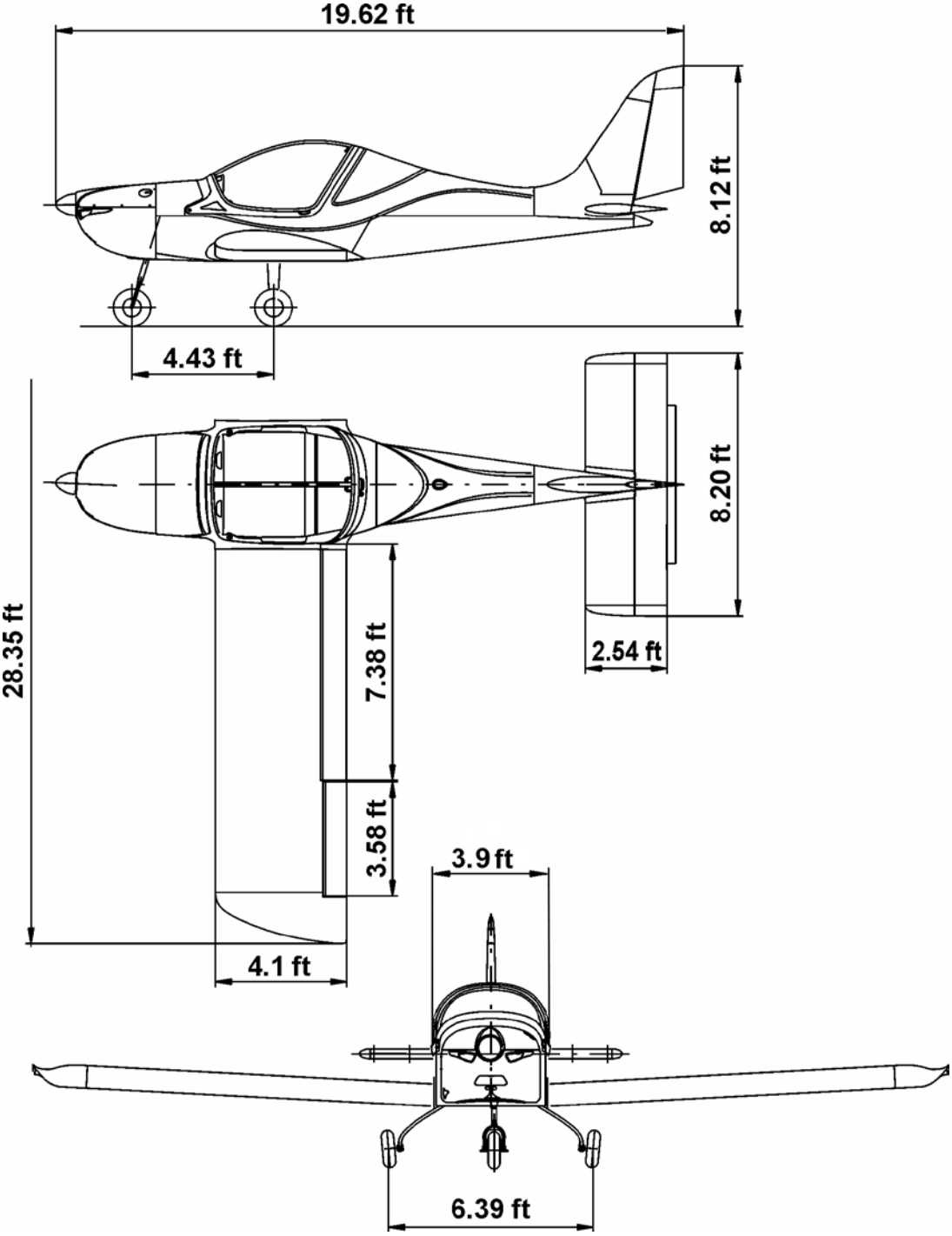
19.62 ft
8.12 ft
4.43 ft
8.20 ft
2.54 ft
28.35 ft
7.38 ft
3.58 ft
3.9 ft
4.1 ft
6.39 ft

Figure 1-1

1.5 Definitions And Abbreviations

NOTE

The abbreviations on placards in the airplane cockpit, are printed in **BOLD CAPITAL LETTERS** in the text of this Aircraft Operating Instructions.

ACCU	accumulator
ALT ENC	encoding altimeter
ATC	air traffic control
bar	1 bar = 100 kPa
BEACON	anti-collision beacon
°C	Degrees Celsius
CAS	calibrated airspeed
CLOCK	aircraft clock
ft	foot 1 ft = 0.305 m
GPS	global positioning system
HTU	horizontal tail unit
IAS	indicated airspeed
IC	intercom
IFR	instrument flight rules
ISA	international standard atmosphere
kg	kilogram
KIAS	indicated airspeed in knots
KCAS	calibrated airspeed in knots
mph	miles per hour
mph CAS	calibrated airspeed in miles per hour
km/h CAS	calibrated airspeed in km/h
kts	knots 1 kt = 1.852 km/h
lbs	pounds 1 lb = 0.45 kg
m	meter
MAC	mean aerodynamic chord
max.	maximum
min.	minimum or minute
mm	millimeter
m/s	meter per second
OAT	outside air temperature
OFF	system is switched off or control element is in off-position
ON	system is switched on or control element is in on-position
Pa	Pascal 1Pa = $1N/m^2$
PSI	pound per sq.in (1PSI = 6.89 kPa)
RPM	revolutions per minute
RWY	runway
sq.ft	square foot
sq.m	square meter
V_A	maneuvering airspeed
V_{FE}	maximum flap extended speed - flaps in 50° position
VFR	visibility flight rules
V_{LOF}	airplane lift-off speed
V-METER	voltmeter
V_{NE}	never exceed speed

V_{NO}	maximum structural cruising speed
V_{SO}	stall speed with wing flaps in 50° position
V_{S1}	stall speed with wing flaps in 0° position
VTU	vertical tail unit
V_X	best angle-of-climb speed
V_Y	best rate-of-climb speed
XPDR	transponder

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2.1 Introduction

Section 2 contains operation limitation, instrument marking and basic placards necessary for safe operation of airplane and its engine, standard systems and equipment.
Limitation for optional systems and equipment are stated in section 9 - Supplements.

2.2 Airspeed

Airspeed limitations and their meaning for operation are stated in the table below:

Speed		KIAS	mph IAS	Meaning
V_{NE}	Never exceed speed	146	168	Do not exceed this speed in any operation.
V_{NO}	Maximum structural cruising speed	115	132	Do not exceed this speed, with exception of flight in smooth air, and even then only with increased caution.
V_A	Maneuvering speed	90	106	Do not make full or abrupt control movement above this speed, because under certain conditions the aircraft may be overstressed by full control movement.
V_{FE}	Maximum flap extended speed	70	81	Do not exceed this speed with the given flap setting.

2.3 Airspeed indicator marking

Airspeed indicator markings and their color-code significance are shown in the table below:

Marking	Range		Meaning
	KIAS	mph IAS	
Red line	37	43	V_{S0} at maximum weight (flaps in landing position 50°)
White arc	37 - 70	44 – 81	Operating range with extended flaps. Lower limit- V_{S0} at maximum weight (flaps 50°) Upper limit - V_{FE}
Green arc	38 - 115	49 – 132	Normal operation range Lower limit - V_{S1} at maximum weight (flaps 0°) Upper limit - V_{NO}
Yellow arc	115 - 146	132 - 168	Maneuvers must be conducted with caution and only in smooth air
Red line	146	168	Maximum speed for all operations - V_{NE}.

2.4 Powerplant

Engine manufacturer:	Bombardier-Rotax GMBH	
Engine type:	ROTAX 912 ULS (S2 for IFR version)	
Power:	maximum take-off	73.5 kW / 100 HP
	maximum continuous	69 kW / 95 HP
Engine speed:	maximum take-off	5800 RPM max. 5 minutes
	maximum continuous	5500 RPM
	idle	1400 RPM
Cylinder head temperature:	maximum	275 °F
Oil temperature:	maximum	266 °F
	optimum operation	190 - 230 °F
Oil pressure:	maximum	102 PSI
	minimum	12 PSI
	optimum operation	29 - 73 PSI
Fuel pressure:	minimum	2.2 PSI
Fuel grades:	see 2.13,	
Oil grades:	see 2.14,	
Reducer gear ratio:	2.43 : 1	

	Standard installed:	IFR version:
Propeller:		
Prop manufacturer:	WOODCOMP s.r.o.	Warpdrive
Propeller type:	KLASSIC 170/3/R 3 blade composite ground adjustable	Warpdrive CF Nickel protection of blade leading edges 3-bladed, composite Ground adjustable
Propeller diameter:	68 in	68 in
Maximum prop speed:	2600 RPM	2600 RPM

NOTE

If installed a different propeller type - see section 9 - Supplements for propeller limitations.

2.5 Powerplant Instrument Marking

The color-code of instruments is shown in the following table:

Instrument	Units	Red line	Green arc	Yellow arc	Red line
		Lower limit	Normal operation range	Caution range	Upper limit
RPM indicator	RPM	-	1400 - 5500	5500 - 5800	5800
Oil temperature indicator	°F	-	190 - 230	120 - 190 230 - 266	266
Oil pressure indicator	PSI	12	29 - 73	12 - 29 73 - 102	102
Cylinder head temperature	°F	-	-	-	275

2.6 Miscellaneous instrument marking

There are not other instruments with color marking.

2.7 Weight

Empty weight (average equipment)	740 lbs ± 2 %
Maximum take-off weight	1320 lbs
Maximum landing weight	1320 lbs
Maximum weight in baggage compartment	55 lbs

WARNING

DO NOT EXCEED MAXIMUM WEIGHTS! THEIR EXCEEDING LEADS TO AIRPLANE OVERLOADING AND TO DEGRADATION OF FLIGHT CHARACTERISTICS AND DETERIORATION OF MANOEUVRABILITY.

2.8 Centre of gravity

Empty airplane C.G. position (standard equipment)	20 ± 2 % MAC
Operating C.G. range	20 to 34 % MAC

Reference datum is the wing leading edge.

2.9 Approved Maneuvers

SportStar MAX airplane is approved to perform the following maneuvers:

- steep turns up to bank angle of 60°
- climbing turns
- lazy eights
- stalls (except for steep stalls)
- normal flight maneuvers

WARNING

AEROBATICS AS WELL AS INTENTIONAL SPINS ARE PROHIBITED!

2.10 Maneuvering Load Factors

Maximum positive load factor	4.0
Maximum negative load factor	-2.0

2.11 Flight crew

Minimum crew	1 pilot
Minimum weight of crew	121 lbs

Maximum weight of crew acc. to chapter 6.

WARNING

DO NOT EXCEED MAXIMUM WEIGHTS! THEIR EXCEEDING LEADS TO AIRPLANE OVERLOADING AND TO DEGRADATION OF FLIGHT CHARACTERISTICS AND DETERIORATION OF MANOEUVRABILITY.

2.12 Operation Types

The airplane is approved for VFR daylight flights.

WARNING

NIGHT FLIGHTS ACCORDING TO VFR, FLIGHTS ACCORDING TO IFR (BY INSTRUMENTS) ARE APPROVED ONLY WHEN INSTRUMENTATION REQUIRED FOR SUCH FLIGHTS IS INSTALLED AND FLIGHT PERFORMED BY A PILOT WITH APPROPRIATE RATING!

NOT AUTHORIZED FOR FLIGHT INTO KNOWN OR FORECAST POSSIBLE ICING CONDITIONS.

NOT AUTHORIZED FOR FLIGHT WITHIN 25 MILES OF KNOWN LIGHTNING OR THUNDERSTORMS.

2.121 INSTRUMENTS AND EQUIPMENT FOR DAY VFR FLIGHTS:

1 Airspeed indicator (the color marking according to par. 0)
1 Sensitive barometric altimeter
1 Magnetic compass
1 Fuel gauge indicator
1 Oil temperature indicator
1 Oil pressure indicator
1 Cylinder head temperature indicator
1 Engine speed indicator
1 Safety harness for every used seat

2.122 INSTRUMENTS AND EQUIPMENT FOR NIGHT VFR FLIGHTS:

F 2245 Annex 2 LSA to be flown at night

2.123 INSTRUMENTS AND EQUIPMENT FOR IFR FLIGHTS:

FAR 91.205 and F2245 Annex 3 Additional Requirements for Light Sport Airplanes Operated Under Instrument Flight Rules, as proposed till 1.1.2009.

Refer to Supplement IFR to this standard Aircraft Operating Instructions

CAUTION

ADDITIONAL EQUIPMENT NECESSARY FOR AIRPLANE OPERATION IS GIVEN IN APPROPRIATE OPERATION REGULATION OF AIRPLANE OPERATOR'S COUNTRY.

2.13 Fuel

The following fuels can be used :

	Usage / Description	
	912 UL / A / F	912 ULS / S
MOGAS		
European standard	EN 228 Normal [1]	
	EN 228 Super [1]	EN 228 Super [2]
	EN 228 Super plus [1]	EN 228 Super plus [2]
Canadian standard	CAN/CGSB3.5 Quality 1 [3]	CAN/CGSB3.5 Quality 3 [4]
US standard	ASTM D4814	ASTM D4814

AVGAS		
US standard	AVGAS 100 LL (ASTM D910)	AVGAS 100 LL (ASTM D910)

[1] min. ROZ 90

[2] min. ROZ 95

[3] min. AKI* 87

[4] min. AKI 91

AVGAS 100LL places greater stress on the valve seats due to its high lead content and forms increased deposits in the combustion chamber and lead sediments in the oil system. Thus it should only be used in case of problems with vapor lock or when other types of gasoline are unavailable.

■ CAUTION: Use only fuel suitable for the respective climatic zone.

◆ NOTE: Risk of vapour formation if using winter fuel for summer operation.

■ CAUTION: Obey the latest edition of Service Instruction SI-912-016 for the selection of the correct fuel.

Fuel tank volume (each)	15.85 U.S. gallons
Total	31.7 U.S. gallons
Usable fuel	31.2 U.S. gallons
Unusable fuel	0.5 U.S. gallons (0.25 US gal per tank)

NOTE

It is not recommended to fully tank the fuel tanks. Due to fuel thermal expansion keep about 2.11U.S. gallons of free space in the tank to prevent fuel bleed through the vents in the wing tips thus preventing environmental contamination. This should be adhered especially when cold fuel from an underground tank is tanked.

2.14 Oil

Performance classification SF, SG according to API
Oil volume:
- minimum 0.53 U.S. gallons
- maximum 0.79 U.S. gallons

2.15 Maximum Number Of Passengers

Maximum number of passengers including pilot 2

2.16 Other limitations

SMOKING IS PROHIBITED on the airplane board.

PASSENGER NOTICE
This aircraft conforms to ASTM Consensus Standards of airworthiness developed and maintained by the aviation community under ASTM Technical Committee F37.

PASSENGER WARNING !
This aircraft was manufactured in accordance with Light Sport Aircraft airworthiness standards and does not conform to standard category airworthiness requirements.

2.17 Limitation Placards

The following placards are located on the instrument panel:

BEFORE TAKE-OFF PUSH CANOPY HANDLE UP
TO CHECK CANOPY FULL CLOSING

The following placards are located on the the tilting canopy:

PASSENGER NOTICE:
THIS AIRCRAFT CONFORMS TO ASTM CONSENSUS STANDARDS OF AIRWORTHINESS DEVELOPED AND MAINTAINED BY THE AVIATION COMMUNITY UNDER ASTM TECHNICAL COMMITTEE F37.

PASSENGER WARNING!
THIS AIRCRAFT WAS MANUFACTURED IN ACCORDANCE WITH LIGHT SPORT AIRCRAFT AIRWORTHINESS STANDARDS AND DOES NOT CONFORM TO STANDARD CATEGORY AIRWORTHINESS REQUIREMENTS.

This placard is located on the top of fixed rear canopy:

CANOPY IS UNLOCKED IF A LATCH
IS VISIBLE UNDER THE GLASS

NOTE

For painted top of the rear glass the latch is visible when looking sideways from under the painted area.

These placards are located on the tip-up canopy close to rear guide pins:

CAUTION !
FINGERS OFF
WHEN CLOSING
THE CANOPY!

The following placard is located in the baggage compartment:

MAX.
55 lbs / 25 kg

The following placard is located behind the baggage compartment:

It prohibits use of that place for additional stowage due to airplane aft C.G. limit.

The following placards are located on sides of the tip-up canopy:

Day VFR airplane

This Light Sport Aircraft has been approved only for VFR day flights under no icing conditions.

Or (Night VFR airplane)

This Light Sport Aircraft has been approved only for day/night VFR flights under no icing conditions.

or (IFR airplane)

This Light Sport Aircraft has been approved by the Manufacturer for IFR flights with the following limitations:
Not authorized for IFR flights into known or forecast possible icing conditions.
Not authorized for IFR flights within 25 miles

and (all versions)

Aerobatics and intentional spins are prohibited!

AIRSPEED IAS	
Never exceed	146 kts
Manoeuvring	90 kts
Max. Flap Extended	70 kts
Stalling	37 kts

ENGINE SPEED	
Max. Take-off (max. 5 min.)	5800 rpm
Max. Continuous	5500 rpm
Idling	1400 rpm

Unusable quantity of fuel	0.5 USgal

Aerobatics and intentional spins are prohibited!

AIRSPEED IAS	
Never exceed	168 MPH
Manoeuvring	106 MPH
Max. Flap Extended	81 MPH
Stalling	44 MPH

ENGINE SPEED	
Max. Take-off (max. 5 min.)	5800 rpm
Max. Continuous	5500 rpm
Idling	1400 rpm

Unusable quantity of fuel	0.5 USgal

LOAD LIMITS							
Max.take-off weight						1320	lbs
Empty weight						700	lbs
Max.baggage weight						55	lbs
PERMITTED CREW WEIGHT							[lbs]
Fuel quantity U.S.gal.		30,0	25,0	20,0	15,0	10,0	5,0
Baggage weight	*max. 55 lbs*	385	415	445	475	505	535
	1/2 28 lbs	412	442	472	502	532	562
	No baggage	440	470	500	530	560	590
Fuel reserve							2 U.S. gallons

NOTE

The values stated on the placard “LOAD LIMITS” are valid for the empty weight of the airplane with average equipment. The placard with values valid for the actual empty weight of the airplane will be placed in the cockpit.

Other placards and labels are shown in Aircraft Maintenance and Inspection Procedures.

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3.0 Introduction

Section 3 describes operations and procedures for emergency situation solutions that could possibly occur during airplane operation.

3.1 Speeds for Performing Emergency Procedures

Airspeed for the best gliding ratio (flaps retracted)	59 KIAS (68 mph IAS)
Precautionary landing(engine running, flaps 50°)	55 KIAS (63 mph IAS)
Emergency landing (engine stopped, flaps 50°)	55 KIAS (63 mph IAS)

3.2 Engine Failure

3.2.1 ENGINE FAILURE AT TAKE-OFF RUN

1.	THROTTLE knob	IDLE
2.	Brakes	AS NECESSARY
3.	FUEL SELECTOR	OFF
4.	Ignition	OFF
5.	Master switch	OFF

3.2.1 ENGINE FAILURE AT TAKE-OFF

1. Gliding speed:

with flaps in take-off position (15°)	55 KIAS (63 mph IAS)
with flaps retracted (0°)	59 KIAS (68 mph IAS)

2. Altitude:

Land in take-off direction if below 150 ft

Land in take-off direction or you can perform turn up to 90° if altitude is 150 - 400 ft

You can try start engine if altitude is above 250 ft

You can perform turn up to 180° if altitude is above 400 ft

3.	THROTTLE knob	IDLE
4.	FLAPS	AS NEEDED
5.	FUEL SELECTOR	OFF
6.	Ignition	OFF

7.	ATC	REPORT
8.	MASTER SWITCH	OFF
9.	After touchdown	BRAKE AS NEEDED

3.2.3 ENGINE FAILURE IN FLIGHT

1.	Gliding speed	59 KIAS (68 MPH IAS)
2.	Altitude	TAKE A DECISION AND CARRY OUT: - ENGINE STARTING IN FLIGHT - 3.4 - EMERGENCY LANDING - 3.8.1

3.3 Engine starting at flight

NOTE

It is possible to start the engine by means of the starter within the whole range of operation speeds as well as flight altitudes. The engine started up immediately after switching the ignition to START position.

If the engine is shut down, the altitude loss during engine starting can reach up to 1000 ft.

1.	Gliding speed	59 KIAS (68 MPH IAS)
2.	Altitude	CHECK
3.	MASTER SWITCH	ON
4.	Unnecessary electrical equipment	SWITCH OFF
5.	FUEL SELECTOR	LEFT
6.	CHOKE	AS NEEDED
7.	THROTTLE knob	IDLE (CHOKE OPENED) OR INCREASED IDLE (CHOKE CLOSED)

The propeller IS rotating:

8.	IGNITION	BOTH

The propeller is NOT rotating:

9.	IGNITION	START
10.	If engine starting does not occur, increase gliding speed up to 108 KIAS (124 mph IAS) (see NOTE), so that air-flow turns the propeller and engine will start.	
11.	IGNITION	BOTH
12.	If engine starting is unsuccessful, then continue according to paragraph 3.8.1 Emergency landing.	

3.4 Engine fire

3.4.1 FIRE ON THE GROUND

1.	FUEL SELECTOR	OFF
2.	BRAKES	BRAKE
3.	THROTTLE knob	FULL
4.	HOT AIR knob (if installed)	PUSH
	After the engine stops:	
5.	IGNITION	OFF
6.	MASTER SWITCH	OFF
7.	Airplane	LEAVE
8.	Manual extinguisher (if available)	USE

3.4.2 FIRE DURING TAKE-OFF

1.	FUEL SELECTOR	OFF
2.	THROTTLE knob	FULL
3.	Airspeed	65 KIAS (75 MPH IAS)
4.	HOT AIR knob (if installed)	PUSH
5.	COLD AIR knob (if installed)	PUSH
	After the engine stops:	
6.	Gliding speed	55 KIAS (63 MPH IAS)
7.	IGNITION	OFF
8.	MASTER SWITCH	OFF
9.	Land	
10.	Airplane	LEAVE
11.	Manual extinguisher (if available)	USE

3.4.3 FIRE IN FLIGHT

1.	FUEL SELECTOR	OFF
2.	THROTTLE knob	FULL
3.	HOT AIR knob (if installed)	PUSH
4.	COLD AIR knob (if installed)	PUSH
5.	Gliding speed	59 KIAS (68 MPH IAS)
6.	IGNITION	OFF
7.	ATC	REPORT IF POSSIBLE
8.	MASTER SWITCH	OFF

NOTE

For extinguishing the engine fire, you can perform slip under assumption that you have sufficient altitude and time.

WARNING

AFTER EXTINGUISHING THE ENGINE FIRE START ENGINE ONLY IF IT NECESSARY TO SAFE LANDING. FUEL LEAK IN ENGINE COMPARTMENT COULD CAUSE FIRE AND FIRE COULD RESTORE AGAIN.

9.	If you start engine again, switch off all switches, switch on the Master switch, and then subsequently switch on only equipment necessary to safe landing.	
10.	Emergency landing	CARRY OUT ACCORDING TO 3.8.1
11.	Airplane	LEAVE
12.	Manual extinguisher (if available)	USE AS NEEDED

3.5 Fire in the cockpit (if manual extinguisher available aboard)

1.	Fire source	IDENTIFY
2.	MASTER SWITCH in case that the source of fire is electrical equipment.	OFF
3.	Manual extinguisher	USE
4.	After fire is extinguished	AERATE THE COCKPIT OPEN EYE-BALL VENTS
5.	Carry out safety landing according to 3.8.2	

WARNING
NEVER AGAIN SWITCH THE DEFECTIVE SYSTEM ON.

NOTE
If a defective electrical system circuit was detected as the fire source, then switch off appropriate circuit breaker and switch over Master switch to ON position.

3.6 Gliding Flight

NOTE
Gliding flight can be used for example in case of engine failure.

Wing flaps position	Retracted (0°)	Take-off (15°)
Airspeed	59 KIAS (68 mph IAS)	55 KIAS (63 mph IAS)

3.7 Emergency landing

3.7.1 EMERGENCY LANDING - WITH NON-OPERATING ENGINE

1.	Airspeed	59 KIAS (68 MPH IAS)
2.	Landing area	CHOOSE, determine wind direction
3.	Safety harness	TIGHTEN
4	Flaps	LANDING POSITION (50°)
5.	Airspeed	60 KIAS (69 MPH IAS)
6.	Radio	NOTIFY situation to ATC (if possible)
7.	FUEL SELECTOR	OFF
8.	Ignition	OFF
9.	Master switch	OFF before touchdown

3.7.2 SAFETY LANDING- WITH ENGINE OPERATING

1.	Area for landing	CHOOSE, determine wind direction, carry out passage flight with speed of 59 KIAS (68 mph IAS), flaps in take-off position (15°)
2.	Radio	NOTIFY situation to ATC (if possible)
3.	Safety harness	TIGHTEN
4.	Flaps	LANDING POSITION (50°)
5.	Airspeed	60 KIAS (69 MPH IAS)
6.	Landing	CARRY OUT

3.7.3 LANDING WITH BURST TIRE

CAUTION

WHEN LANDING AT HOLDING, KEEP THE WHEEL WITH BURST TIRE ABOVE THE GROUND AS LONG AS POSSIBLE BY MEANS OF AILERONS. IN CASE OF NOSE WHEEL BY MEANS OF ELEVATOR.

1. At running hold airplane direction by means of foot control and brakes

3.7.4 LANDING WITH DAMAGED LANDING GEAR

1. In case of nose landing gear damage touch down at the lowest possible speed and try to keep the airplane on main landing gear wheels as long as possible
2. In case of main landing gear damage touch down at he lowest possible speed and if possible keep direction at running

3.8 Unintentional spin recovery

NOTE

The airplane has not, when using normal techniques of pilotage, tendency to go over to spin spontaneously. Standard procedure of recovery from spin:

1.	THROTTLE knob	IDLE
2.	CONTROL STICK	AILERONS - NEUTRAL POSITION
3.	PEDALS	KICK the rudder pedal push against spin rotation direction
4.	CONTROL STICK	PUSH FORWARD and hold it there until rotation stops
5.	PEDALS	IMMEDIATELY AFTER ROTATION STOPS, set the rudder to neutral position
6.	CONTROL STICK	RECOVER THE DIVE

CAUTION

ALTITUDE LOSS PER ONE TURN AND RECOVERING FROM THE SPIN IS 500 UP TO 1000 FT.

3.9 Other emergency procedures

3.9.1 VIBRATION

If abnormal vibrations occur on the airplane then:

1. Set engine RPM to the mode in which the vibrations are the lowest
2. Land on the nearest possible airport, possibly perform safety landing according to par. 3.8.2. Safety landing.

3.9.2 CARBURETTOR ICING

Carburetor icing happens when air temperature drop in the carburetor occurs due to its acceleration in the carburetor and further cooling by evaporating fuel. Carburetor icing mostly happens during descending and approaching for landing (low engine RPM). Carburetor icing shows itself by engine power decreasing and by engine temperature increasing.

Recommended procedure for engine power regeneration is as follows:

1. CARB. PREHEATER (if installed) ON
2. THROTTLE knob SET IDLE AND THEN CRUISING POWER AGAIN

NOTE

Ice coating in the carburetor should be removed by decrease and increase of engine power.

3. If the engine power is not successfully increased, then carry out landing at the nearest suitable airport or, if it is not possible, carry out precautionary landing.

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4.1 Introduction

Section 4 describes operations and recommended procedures for normal operation of the airplane. Normal procedures following from system installation and optional equipment, which require supplementation of these Instructions, are shown in section 9 - Supplements.

4.2 Recommended speeds for normal procedures

4.21 TAKE-OFF

Climbing speed up to 50 ft (flaps in take-off pos. - 15°)	57 KIAS (66 mph IAS)
Best rate-of-climb speed V_Y (flaps in take-off pos. - 15°)	57 KIAS (66 mph IAS)
Best rate-of-climb speed V_Y (flaps retracted - 0°)	65 KIAS (74 mph IAS)
Best angle-of-climb speed V_X (flaps in take-off pos. - 15°)	54 KIAS (63 mph IAS)
Best angle-of-climb speed V_X (flaps retracted - 0°)	56 KIAS (65 mph IAS)

4.22 LANDING

Approaching speed for normal landing (flaps in landing position - 50°)	60 KIAS (69 mph IAS)

4.3 Assembly and disassembly

Description of assembly and disassembly is given in the SportStar MAX Aircraft Maintenance and Inspection Procedures.

4.4 Pre-flight check

Carry out pre-flight check according to the following procedure:

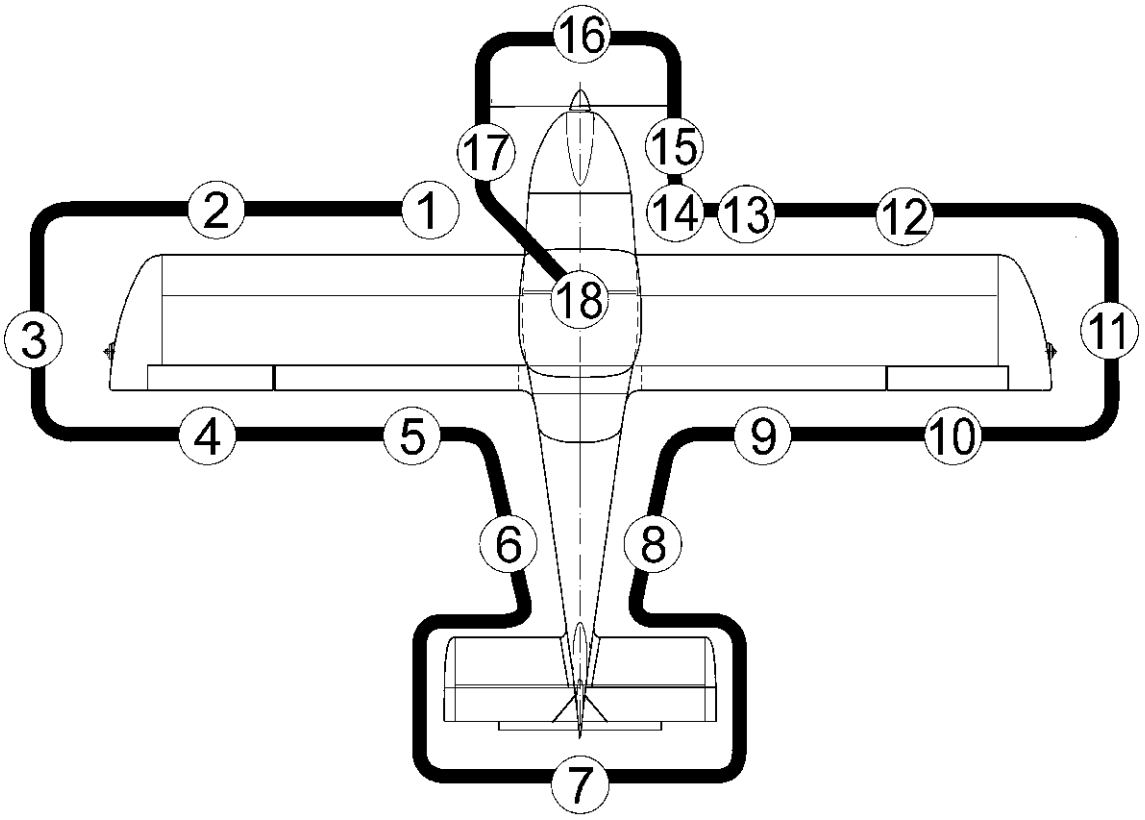

Figure 4-1 Scheme of airplane preflight check

WARNING

CHECK BEFORE PRE-FLIGHT CHECK THAT IGNITION IS SWITCHED OFF!

NOTE

The word “condition”, used in procedures of pre-flight check, means visual check of surface, damage, deformation, scratches, attrition, corrosion, icing or other effects decreasing flight safety.

1. Left landing gear leg - check
   - landing gear leg attachment and condition
   - landing gear wheel condition
   - tire condition and inflation
   - condition and attachment of wheel covers
   - ground cable condition (if installed)
2. Left wing - check
   - wing surface condition
   - leading edge condition
   - landing light condition - if installed
   - condition of the Pitot tube
   - draining of fuel tank (see Chapter 8, page 8-6)
   - closing of fuel tank cap
3. Left wing tip - check
   - surface condition
   - attachment check
   - fuel tank vent - cleanness
   - condition and attachment of the position lights and the anticollision beacon - if installed
4. Left aileron - check
   - surface condition
   - condition of trim tab (if installed) and its control (electr.trim)
   - attachment
   - free movement
5. Left wing flap - check
   - surface condition
   - attachment
6. Rear part of fuselage - check
   - surface condition
   - condition of antennas (top and bottom fuselage surface) - if installed

7. Tail units - check
   - tail skid condition
   - surface condition
   - condition of rudder and elevator attachment
   - freedom of rudder and elevator movement
   - condition of trim tab, condition of elevator trim tab control
8. Rear part of fuselage - check
   - surface condition
9. Right wing flap- see 5.
10. Right aileron- see 4. except the trim tab
11. Right wing tip - see 3.
12. Right wing - see 2. except the landing light
    - Alternate pitot tube (IFR airplane)
    - AOA probe (if installed)
13. Right landing gear leg - see 1.
14. Front part of the fuselage - right hand side - check
    - Tip-up canopy attachment and condition
    - condition of the nose landing gear leg
    - nose wheel condition
    - condition of the nose wheel control rods
    - external power socket (if installed)
15. Engine

    Checks before the first flight of day - it is necessary to remove upper engine cowling:
    - condition of engine bed
    - condition of engine attachment
    - condition of exhaust system
    - condition of engine cowlings
    - visual check on fuel and electrical system condition

- check on cooling liquid volume in the expansion tank on the engine body (replenish as required up to max. 2/3 of the expansion tank volume)

Checks before every flight:

- cleanness of air intakes
- check on oil level (between marks - flattenings on the dip stick)
- check on cooling liquid level in the overflow bottle (volume should be approx. 0.42 pints (0.2 litre))
- proper closing of the upper cowling

16. Propeller - check
    - attachment
    - condition of blades, hub and spinner
17. Front part of fuselage - left hand side - check
    - tip-up canopy attachment and condition
18. Cockpit - check

NOTE

Canopy is unlocked if a latch next to lock is visible under the glass, otherwise it is locked. Unlock it first with key.

1.	MASTER SWITCH	SWITCH ON
2.	Check canopy OPEN/CLOSE indication light (or a message on the EFIS display) function	
3.	ALL SWITCHES	OFF
4.	Instrument equipment	CHECK on condition
5.	CHECK on presence of loose object in the cockpit	
6.	CHECK on adjusting and securing the rudder pedals (see section 7.3.3) - if installed adjustable rudder pedals	

WARNING

RIGHT AND LEFT PEDAL OF RUDDER CONTROL MUST BE SET TO THE SAME POSITIONS AND WELL SECURED!

7. AOI and other required documents check on completeness and validity

4.5 Normal procedures and checklist

4.5.1 BEFORE ENGINE STARTING

1.	Pre-flight check and check on weight and centre of gravity position	DONE
2.	External power source (if socket is installed)	CONNECT as necessary
3.	Safety harnesses	CHECK, FASTEN
4.	CONTROL STICK	FREE
5.	RUDDER PEDALS	FREE
6.	Wing flaps	FUNCTION CHECK
7.	TRIM TAB	FUNCTION CHECK
8.	PARKING BRAKE handle (if installed)	RELEASE BRAKES
9.	Brakes	FUNCTION CHECK
10.	AVIONICS SWITCH	CHECK OFF
11.	IGNITION	CHECK OFF
12.	Canopy	CLOSE

5.5.2 ENGINE STARTING

1.	MASTER SWITCH	ON
2.	Fuel gauge indicators	CHECK fuel qty.
3.	FUEL SELECTOR Pull the safety button on the fuel selector, turn the handle to the left and then release safety button. Now the handle can be freely moved between left and right position. Safety button prevents unintentionally switch the selector to OFF position.	LEFT
4.	Electric fuel pump (if installed)	ON
5.	THROTTLE knob	idle
6.	Choke	AS NECESSARY (open by pulling up and lock by turning)
7.	Space in the propeller area	FREE
8.	BEACON (if installed)	ON
9.	Brakes	APPLY
10.	IGNITION	START (see CAUTION) after starting up BOTH

CAUTION

ACTIVATE STARTER FOR 10 SEC. AS A MAXIMUM, THEN LET IT COOL DOWN FOR 2 MINUTES.

AFTER STARTING UP ENGINE, DO NOT CARRY OUT SUDDEN RPM CHANGES, AFTER POWER DECREASE WAIT FOR ABOUT 3 S IN ORDER TO REACH CONSTANT RPM BEFORE REACCELERATION.

11.	THROTTLE knob	AS NECESSARY (see NOTE)
12.	Oil pressure	UP TO 10 SECONDS MIN. PRESSURE
13.	GEN, AUX GEN (if inst.) switches	ON

NOTE

After starting up engine, adjust throttle for smooth engine running at about 2500 RPM. Check oil pressure. Pressure must increase within 10 s. Increase engine RPM until oil pressure is stabilized over 2 bar (29 PSI).

14.	Engine instruments	CHECK
15.	Choke	AS NECESSARY
16.	Engine warm up	SEE NOTE

NOTE

Begin warming up with engine running at 2000 RPM. for about 2 minutes, continue at 2500 RPM. Warming time depends on outside air temperature until oil temperature reaches 122 °F.

17.	FUEL SELECTOR Verify proper engine feeding from the right tank for approx. 1 minute.	RIGHT
18.	FUEL SELECTOR	LEFT

NOTE

Start engine with the fuel selector set to **LEFT**. If you would start the engine with the fuel selector set to **RIGHT** and the left tank is full, than fuel bleed from the left tank vent may occur (and pollute environment) because a fuel return hose is led only into the left tank and returning fuel will overfill the left tank.

19.	External power source (if socket is installed)	If used, give instruction to DISCONNECT it
20.	AVIONICS SWITCH	ON
21.	Radios/avionics equipment	ON
22.	Other electrical equipment	ON as necessary

4.5.3 BEFORE TAXIING

1.	Transponder (if installed)	STBY
2.	Navigation/Anti-collision lights	ON

4.5.4 TAXIING

1.	THROTTLE knob	AS NECESSARY
2.	Brakes	CHECK by depressing
3.	Rudder pedals	FUNCTION CHECK
4.	Direction of taxiing control by rudder pedals (these are mechanically connected with nose wheel control), possibly by slacking up left and right wheel of the main landing gear.	

4.5.5 BEFORE TAKE-OFF

1.	Brakes	BRAKE
2.	Ignition check	CARRY OUT, see NOTE

NOTE

Carry out ignition check in the following way : Set engine speed to 4000 RPM. Switch ignition gradually to L, BOTH, R position and return to BOTH..

RPM drop with one ignition circuit switched off must not exceed 300 RPM. Maximum RPM difference at using one of the L or R circuits is 120 RPM.

3.	Engine instruments	CHECK
4.	Control stick	FREE
5.	Wing flaps	TAKE-OFF POS. (15°)
6.	Elevator trim	NEUTRAL
7.	Aileron trim (if installed)	NEUTRAL
8.	Fuel gauge indicator	CHECK on fuel quantity
9.	FUEL SELECTOR	CHECK LEFT
10.	CARB.R PREHEATER (if installed)	CHECK FUNCTION then OFF

NOTE

If CARBURETTOR PREHEATER is switched ON, then engine RPM drop reaches approximately 50 RPM

11.	Engine instruments	CHECK
12.	Flight instruments	CHECK
13.	Radios/avionics	CHECK, SET
14.	IGNITION	CHECK BOTH
15.	CHOKE	CLOSE (in inserted position)
16.	MASTER SWITCH	CHECK ON
17.	Safety harnesses	TIGHTEN
18.	Canopy	CLOSED
19.	Transponder (if installed)	ON OR ALT

4.5.6 TAKE-OFF

1.	THROTTLE knob	MAX. TAKE-OFF POWER
2.	During take-off run smootly lighten up the nose landing gear until airplane take-off occurs.	
3.	Airspeed	57 KIAS (66 mph IAS)
4.	Brakes	BRAKE to stop main wheel rotation
5.	After reaching 150 ft , set flaps to retracted pos. (0°)	
6.	Trim	AS NECESSARY

WARNING

TAKE-OFF IS PROHIBITED:

- IF ENGINE RUNNING IS IRREGULAR
- IF CHOKE IS OPEN
- IF VALUES OF ENGINE INSTRUMENTS ARE NOT WITHIN THE REQUIRED RANGE

4.5.7 CLIMB

1.	THROTTLE knob	MAX CONTINUOUS POWER
2.	Airspeed	V_Y = 65 KIAS (75 mph IAS) for the best rate of climb or VX = 56 KIAS (64 mph IAS) for the best angle of climb
3.	Engine instruments	CHECK
4.	Trim	AS NECESSARY
5.	Electric fuel pump (if installed)	OFF

4.5.8 CRUISE

1.	THROTTLE knob	AS NECESSARY
2.	Airspeed	MAX 5500 RPM
3.	Engine instruments	CHECK
4.	Fuel quantity	CHECK

CAUTION

FUEL GAUGES DISPLAY TRUE FUEL QUANTITY ONLY ON GROUND AND IN A LEVEL FLIGHT. TO READ TRUE FUEL QUANTITY AFTER TRANSITION FROM CLIMB/DESCENT WAIT APPROX. 2 MINUTES TO FUEL TO LEVEL.

NOTE

It is recommended to alternately switch the tanks during cruise to equally consume fuel from both tanks and minimize airplane tendency to bank with unbalanced tanks.

Do not fly with the fuel selector set to RIGHT if the left tank is full to avoid fuel bleed from left tank vent.

When the left tank fuel gauge indicates approx. 1/8 of fuel quantity (needle in the middle between 1/4 and 0) then switch to the right tank to consume remaining fuel and then switch back the left tank to complete the flight at left tank. If the engine conks out due to fuel consumption from either tank, then immediately switch the fuel selector to other tank and engine run will be recovered within 7 seconds.

5.	CARB.PREHEATER (if installed)	AS NECESSARY

4.5.9 DESCENT

1.	THROTTLE knob	CHECK AS NECESSARY
2.	Airspeed	CHECK AS NECESSARY
3.	Trim	AS NECESSARY
4.	Engine instruments	CHECK REGULARLY
5.	CARB.PREHEATER (if installed)	AS NECESSARY

CAUTION

AT LONG APPROACHING AND DESCENDING FROM HIGH ALTITUDE IT IS NOT SUITABLE TO REDUCE THROTTLE TO MINIMUM FOR THE REASON OF POSSIBLE ENGINE UNDERCOOLING AND SUBSEQUENT LOSS OF POWER. PERFORM DESCENDING AT INCREASED IDLE AND CHECK OBSERVANCE OF THE ALLOWED VALUES ON ENGINE INSTRUMENTS.

4.5.10 BEFORE LANDING

1.	Fuel quantity	CHECK

CAUTION

FUEL GAUGES DISPLAY TRUE FUEL QUANTITY ONLY ON GROUND AND IN A LEVEL FLIGHT. TO READ TRUE FUEL QUANTITY AFTER TRANSITION FROM CLIMB/DESCENT WAIT APPROX. 2 MINUTES TO FUEL TO LEVEL.

2.	FUEL SELECTOR	LEFT
3.	Engine instruments	CHECK
4.	Brakes	CHECK by depressing pedals
5.	Safety harnesses	TIGHTEN
6.	Landing area free of obstructions	CHECK
7.	CARB.PREHEATER (if installed)	ON
8.	Approach speed	CHECK 60 KIAS (69 mph IAS)
9.	Flaps	CHECK Take-off pos. (15°)
10.	Trim	AS NECESSARY
11.	Parking brake (if installed)	CHECK for lever down

CAUTION

PARKING BRAKE MUST BE RELEASED (LEVER DOWN) TO PREVENT LANDING WITH BRAKED WHEELS.

12.	Electric fuel pump (if installed)	ON

4.5.11 FINAL APPROACH

1.	Flaps	CHECK landing pos. (30° or 50°)
2.	Maintain airspeed	60 KIAS (69 mph IAS)
3.	Trim	AS NECESSARY
4.	CARB.PREHEATER (if installed)	OFF

4.5.12 BALKED LANDING

1.	THROTTLE knob	SET max. take-off power
2.	Flaps	SET take-off pos. (15°)
3.	Airspeed	CHECK 56 KIAS (65 mph IAS)
4.	Flaps at 150 ft AGL	SET retracted pos. (0°)
5.	Trim	AS NECESSARY
6.	THROTTLE knob	SET max. continuous power
7.	Instruments	CHECK
8.	Climb airspeed	CHECK 65 KIAS (74 mph IAS)

4.5.13 LANDING

1.	THROTTLE knob	SET idle
2.	Touch-down on main landing gear wheels	
3.	Brakes	AS NECESSARY after nose landing gear wheel touchdown

4.5.14 AFTER LANDING

1.	Flaps	RETRACT pos. (0°)
2.	Trim	NEUTRAL
3.	Landing lights	OFF
4.	Transponder	OFF
5.	Electric fuel pump (if installed)	OFF

4.5.15 ENGINE SHUT-OFF

1.	THROTTLE knob	SET idle
2.	Engine instruments	CHECK
3.	Radios/avionics	OFF
4.	AVIONICS SWITCH	OFF
5.	Other electrical equipment	OFF
6.	IGNITION	OFF

7.	Exterior beacon and anti-collision lights	OFF
8.	MASTER SWITCH	OFF

4.5.16 AIRPLANE PARKING

1.	IGNITION	CHECK OFF
2.	MASTER SWITCH	CHECK OFF
3.	FUEL SELECTOR	CHECK OFF

Pull the safety button on the fuel selector, turn the handle to the OFF position and then release safety button. Now the handle is blocked in the OFF position. Safety button prevents unintentionally switch the selector from the OFF position.

4.	PARKING BRAKE (if installed)	SET
5.	Canopy	CLOSE

NOTE

It is recommended to use parking brake (if installed) for short-time parking only, between flights during a flight day. After ending the flight day or at low temperatures of ambient air, do not use parking brake, but use the wheel chocks instead.

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Introduction

Section 5 provides data for airspeed calibration, stall speeds, take-off performance and additional information, provided by the airplane manufacturer.

The stated performance data has been computed from actual flight tests with the airplane and engine in good condition and using average piloting techniques.

CAUTION

THE PERFORMANCE STATED IN THIS SECTION IS VALID FOR STANDARD POWERPLANT - ROTAX 912 ULS (100 HP) TOGETHER WITH WOODCOMP KLASSIC 170/3/R PROPELLER INSTALLED IN THE AIRPLANE.

FOR ACTUAL PERFORMANCE SEE SECTION 9 - SUPPLEMENTS.

6.1 Approved data

6.1.1 AIRSPEED INDICATOR SYSTEM CALIBRATION

NOTE

Assumed zero instrument error. Valid for airplane take-off weight 1320 lbs (600 kg) and with vortex generators along the whole span of the wing.

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		RETRACTED 0°	TAKEOFF 15°	LANDING I 30°	LANDING II 50°
	KIAS	KCAS	KCAS	KCAS	KCAS
VS0	37		43	42	42
VS1	**38**	45	44	43	42
	39	46	44	44	43
	40	47	45	45	44
	41	48	46	46	45
	42	48	47	47	46
	43	49	48	48	47
	44	50	49	48	48
	45	51	50	49	48
	50	55	54	53	53
	55	59	58	58	57
	60	63	62	62	62
	65	67	67	66	66
VFE	**70**	71	71	70	70
	75	75			
	80	80			
	85	84			
VA	**90**	89			
	95	93			
	100	98			
	105	103			
	110	107			
VNO	**115**	112			
	120	117			
	125	122			
	130	127			
	135	132			
	140	138			
VNE	**146**	144			

		RETRACTED	TAKEOFF 15°	LANDING I 30°	LANDING II 50°
	IAS (mph)	CAS (mph)	CAS (mph)	CAS (mph)	CAS (mph)
VS0	43		49	49	48
VS1	**44**	52	50	50	49
	45	53	51	51	50
	50	57	56	55	54
	55	61	60	59	59
	60	65	64	64	63
	65	69	68	68	67
	70	73	73	72	72
	75	77	77	76	76
	80	81	81	80	80
VFE	**81**	82	82	81	81
	85	86			
	90	90			
	95	94			
	100	99			
	105	103			
VA	**106**	104			
	110	108			
	115	113			
	120	117			
	125	122			
	130	127			
VNO	**132**	129			
	135	132			
	140	137			
	145	142			
	150	147			
	155	152			
	160	157			
	165	162			
VNE	**168**	166			

6.1.2 STALL SPEEDS

Conditions:

- Wing level stall - engine at idle power
- Turning flight stall - engine at 75% max. continuous power
- Airplane weight: 1320 lbs (600 kg)
- Vortex generators along the whole span of the wing

NOTE

The stated stall speeds are valid for all flight altitudes. Altitude losses shown in the table present max. values determined on the basis of flight tests using average piloting technique.

1320 lbs 600 kg	Flaps position	Stall speed		Altitude loss
		KIAS	KCAS	ft
Wing level flight	Retracted (0°)	38	45	200
	Take-off (15°)	37	43	
	Landing (50°)	37	42	
Turn flight (coordinated turn 30° bank)	Retracted (0°)	44	50	200
	Take-off (15°)	43	48	
	Landing (50°)	43	47	

1320 lbs 600 kg	Flaps position	Stall speed		Altitude loss
		IAS [mph]	CAS [mph]	ft
Wing level flight	Retracted (0°)	44	52	200
	Take-off (15°)	43	49	
	Landing (50°)	43	48	
Turn flight (coordinated turn 30° bank)	Retracted (0°)	50	57	200
	Take-off (15°)	49	55	
	Landing (50°)	49	54	

6.1.3 TAKE-OFF DISTANCE

Conditions:

- Engine: max. take-off power
- Flaps: Take-off (15°)
- Carburetor preheating: OFF
- Airplane weight: 1268 lbs
- Altitude: 0 ft ISA
- Ambient air temperature: ISA

	Take-off run	Take-off distance to height of 50 ft (15 ft)
Dray concrete	620 ft	1440 ft
Grass	720 ft	1540 ft

Corrections:

- Influence of wind: Add 4% on every 1 kt (1.15 mph) of tail wind
- RWY inclination: Add 8% of the take-off run distance on 1% of runway inclination up the slope

6.1.4 LANDING DISTANCE

Conditions:

- Engine: IDLE
- Flaps: Landing 50°
- Carburetor preheating: OFF
- Airplane weight: 1268 lbs
- Altitude: 0 ft ISA
- Ambient air temperature: ISA

	Landing distance from height of 50 ft (15 ft)	Braked landing run
Dray concrete	1310 ft	590 ft
Grass	1250 ft	520 ft

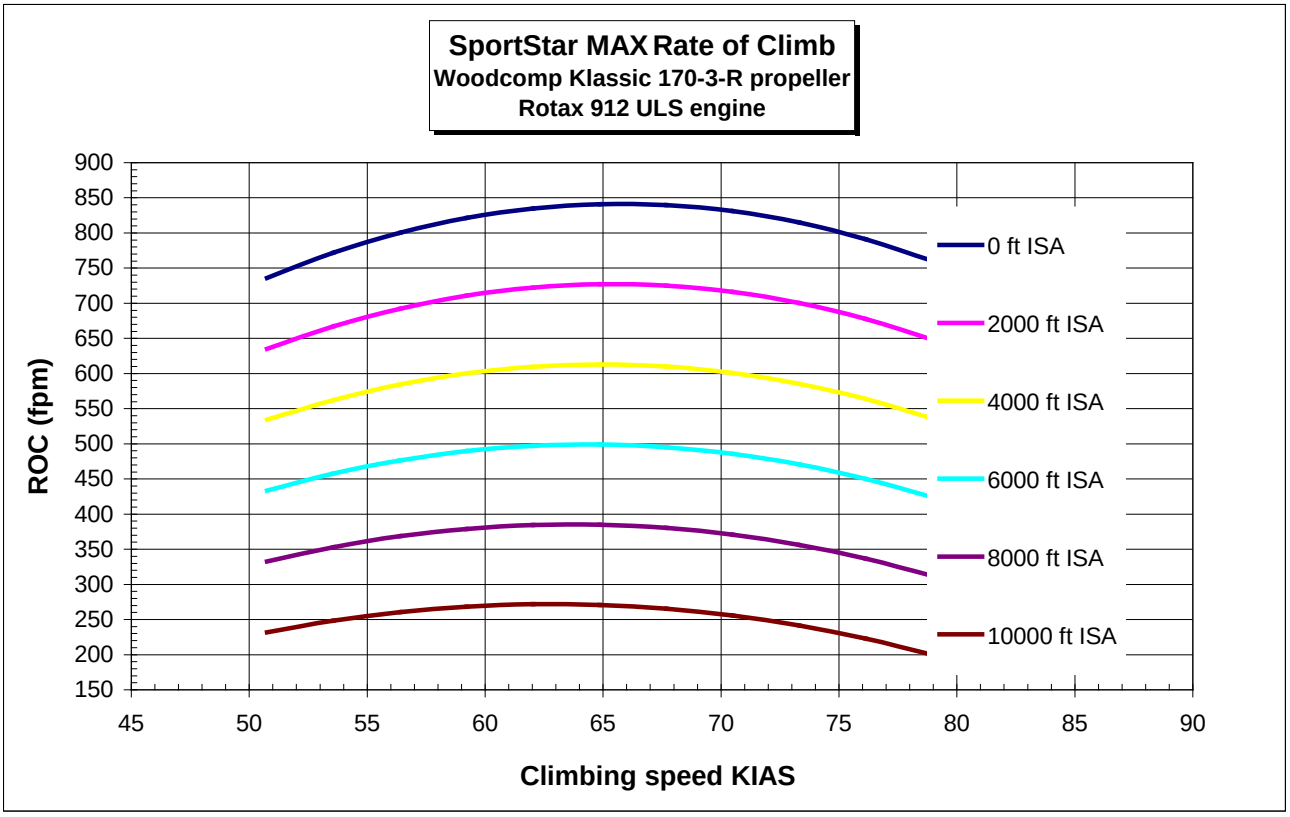
Corrections:

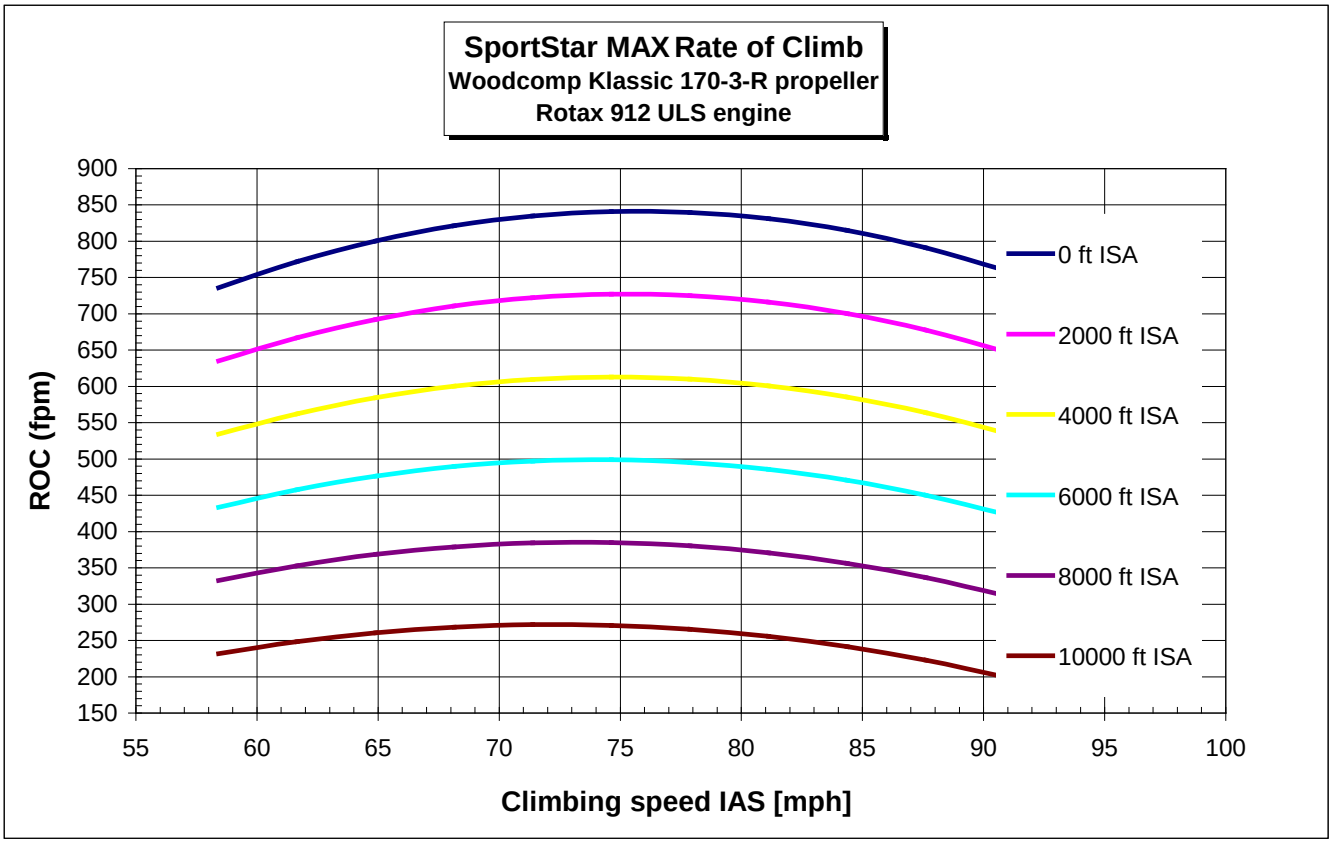
- Influence of wind: Add 4.5 % on every 1 kt (1.15 mph) of tail wind
- RWY inclination: Add 8% of the landing run distance on 1% of runway Inclination down the slope

6.1.5 CLIMB PERFORMANCE

Conditions:

- Engine: MAXIMUN TAKE-OFF POWER
- Flaps: RETRACTED (0°)
- Carburetor preheating: OFF
- Airplane weight: 1320 lbs
- Vortex generators Along the whole span of the wing
- Ambient air temperature: ISA





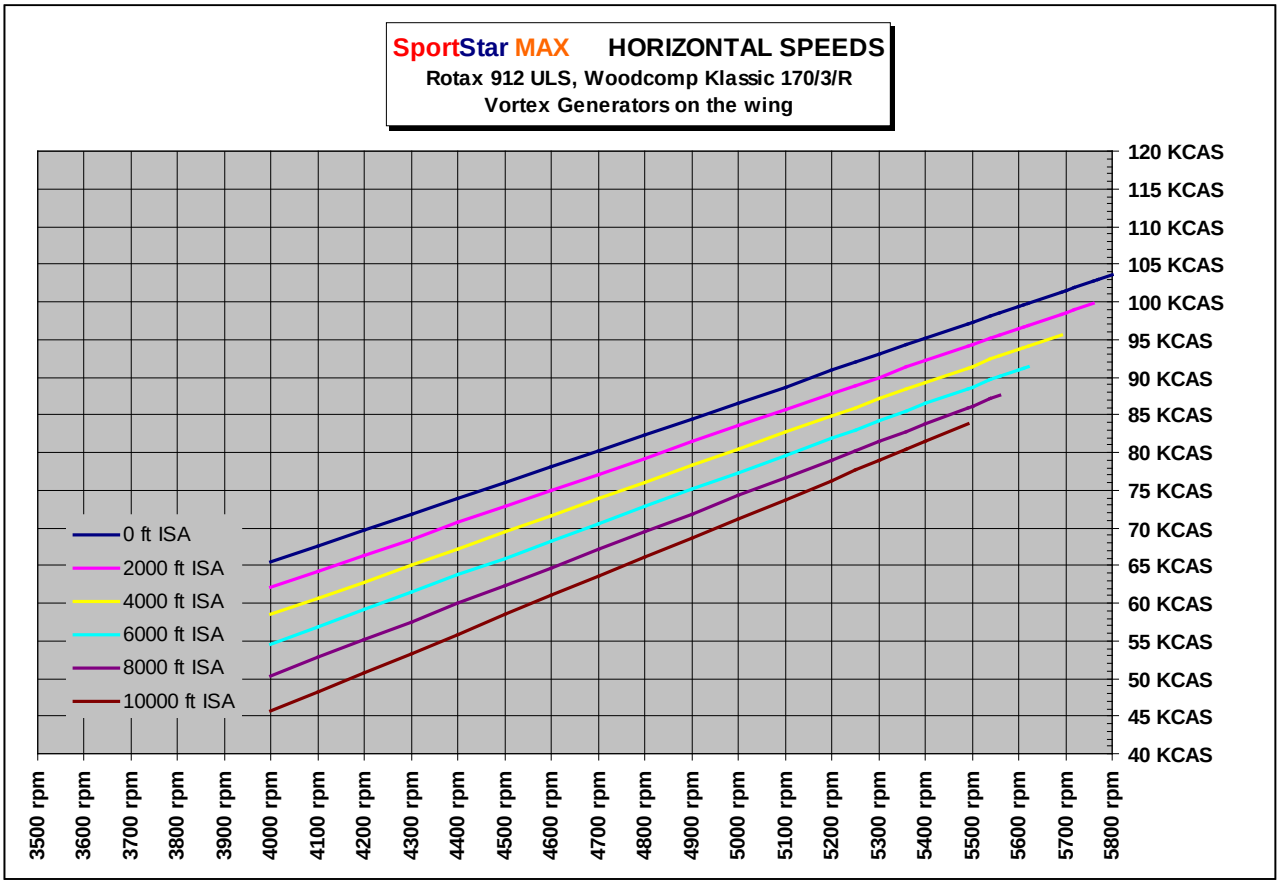
Best rate of climb for various altitudes is mentioned in the following table:

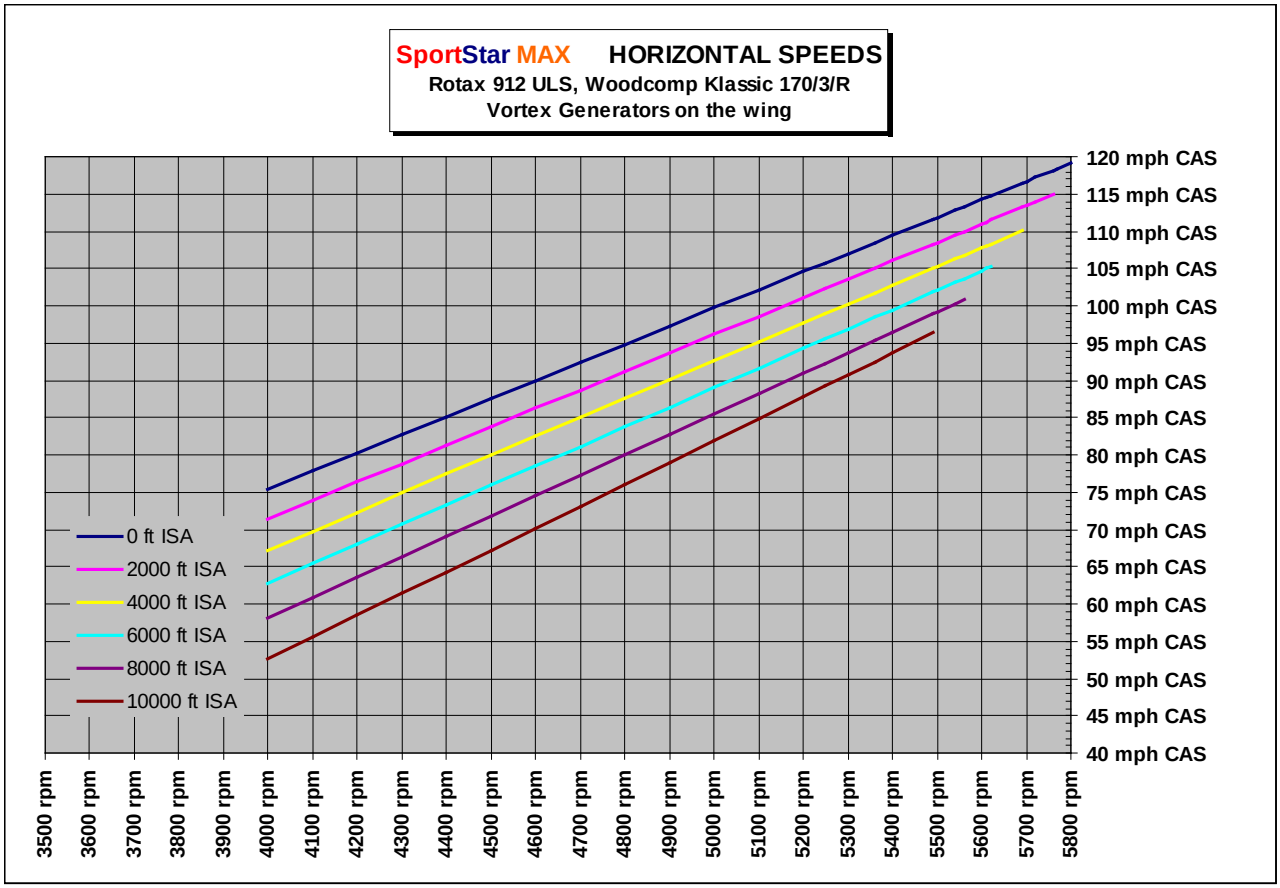
Altitude	Best rate of climb speed		Max. ROC
Hp [ft ISA]	KIAS	IAS [mph]	[fpm]
0 ft ISA	66	76	840
2000 ft ISA	65	75	730
4000 ft ISA	65	75	610
6000 ft ISA	64	74	500
8000 ft ISA	64	74	390
10000 ft ISA	63	72	270

6.2 Additional information

6.2.1 CRUISE

- Conditions:
- Flaps: Retracted (0°)
- Carburetor preheating: OFF
- Airplane weight: 1320 lbs (600 kg)
- Vortex generators Along the whole span of the wing
- Ambient air temperature: ISA




SportStar MAX HORIZONTAL SPEEDS
Rotax 912 ULS, Woodcomp Klassic 170/3/R
Vortex Generators on the wing
0 ft ISA
2000 ft ISA
4000 ft ISA
6000 ft ISA
8000 ft ISA
10000 ft ISA
120 mph CAS
115 mph CAS
110 mph CAS
105 mph CAS
100 mph CAS
95 mph CAS
90 mph CAS
85 mph CAS
80 mph CAS
75 mph CAS
70 mph CAS
65 mph CAS
60 mph CAS
55 mph CAS
50 mph CAS
45 mph CAS
40 mph CAS
3500 rpm
3600 rpm
3700 rpm
3800 rpm
3900 rpm
4000 rpm
4100 rpm
4200 rpm
4300 rpm
4400 rpm
4500 rpm
4600 rpm
4700 rpm
4800 rpm
4900 rpm
5000 rpm
5100 rpm
5200 rpm
5300 rpm
5400 rpm
5500 rpm
5600 rpm
5700 rpm
5800 rpm

6.2.2 HORIZONTAL SPEEDS

In the following table states Indicated airspeeds (IAS), corresponding calibrated air speeds (CAS) and true air speeds (TAS) versus altitude, all for various engine speeds.

		55% MTV	65% MTV	75% MTV	MCP Maximum Continuous Power	MTP Maximum Takeoff Power (5 min.)
		4300 rpm	4800 rpm	5000 rpm	5500 rpm	5800 rpm
0 ft ISA	KIAS	71	83	88	99	106
	KCAS	72	82	87	97	103
	KTAS	72	82	87	97	104
2000 ft ISA	KIAS	67	80	84	96	
	KCAS	69	79	84	94	
	KTAS	71	82	86	97	
4000 ft ISA	KIAS	63	76	81	93	
	KCAS	65	76	80	91	
	KTAS	69	81	85	97	
6000 ft ISA	KIAS	58	72	77	90	
	KCAS	61	73	77	89	
	KTAS	67	80	85	97	
8000 ft ISA	KIAS	54	68	74	87	
	KCAS	58	69	74	86	
	KTAS	65	78	84	97	
10000 ft ISA	KIAS	48	64	70		
	KCAS	53	66	71		
	KTAS	62	77	83		

			55% MTV	65% MTV	75% MTV	MCP Maximum Continuous Power	MTP Maximum Takeoff Power (5 min.)
			4300 rpm	4800 rpm	5000 rpm	5500 rpm	5800 rpm
0 ft ISA	IAS	[mph]	82	96	101	114	122
	CAS	[mph]	83	95	100	112	119
	TAS	[mph]	83	95	100	112	119
2000 ft ISA	IAS	[mph]	77	91	97	111	
	CAS	[mph]	79	91	96	109	
	TAS	[mph]	81	94	99	112	
4000 ft ISA	IAS	[mph]	72	87	93	107	
	CAS	[mph]	75	88	93	105	
	TAS	[mph]	79	93	98	112	
6000 ft ISA	IAS	[mph]	67	83	89	104	
	CAS	[mph]	71	84	89	102	
	TAS	[mph]	77	92	97	112	
8000 ft ISA	IAS	[mph]	62	78	85	100	
	CAS	[mph]	66	80	85	99	
	TAS	[mph]	75	90	96	112	
10000 ft ISA	IAS	[mph]	56	74	81		
	CAS	[mph]	61	76	82		
	TAS	[mph]	71	89	95		

6.2.3 ENDURANCE

Conditions:

- Flaps: Retracted (0°)
- Carburetor preheating: OFF
- Airplane takeoff weight: 1320 lbs (600 kg)
- Airplane empty weight: 740 lbs (335 kg)
- Vortex generators Along the whole span of the wing
- Ambient air temperature: ISA

LOAD LIMITS	
Max.take-off weight	**1320 lb**
Empty weight	740 lb
Max.baggage weight	55 lb

PERMITTED CREW WEIGHT

		30 USGAL	25 USGAL	20 USGAL	15 USGAL	10 USGAL	5 USGAL
Baggage max.	**55 lb**	**345 lb**	**375 lb**	**405 lb**	**435 lb**	**465 lb**	**495 lb**
Baggage 1/2	**28 lb**	**372 lb**	**402 lb**	**432 lb**	**462 lb**	**492 lb**	**522 lb**
No baggage	**0 lb**	**400 lb**	**430 lb**	**460 lb**	**490 lb**	**520 lb**	**550 lb**

ENDURANCE AND RANGE Altitude 2000 ft ISA		55% MCP	65% MCP	75% MCP	MCP Max.Continuous Power
Engine speed	[rpm]	4300	4800	5000	5500
Fuel consumption	[USgal/h]	3,7	4,9	5,4	6,6
IAS	[knots]	67	80	84	96
	[mph]	77	91	97	111
CAS	[knots]	69	79	84	94
	[mph]	79	91	96	109
TAS	[knots]	71	82	86	97
	[mph]	81	94	99	112

Endurance at	**30 USGAL**	[h:m]	8:03	6:05	5:31	4:31
Range at		[NM]	570	500	480	440
		[miles]	660	580	550	510

Endurance at	**25 USGAL**	[h:m]	6:42	5:04	4:36	3:46
Range at		[NM]	470	410	400	370
		[miles]	540	470	460	430

Endurance at	**20 USGAL**	[h:m]	5:22	4:03	3:41	3:00
Range at		[NM]	380	330	320	290
		[miles]	440	380	370	330

Endurance at	**15 USGAL**	[h:m]	4:01	3:02	2:45	2:15
Range at		[NM]	280	250	240	220
		[miles]	320	290	280	250

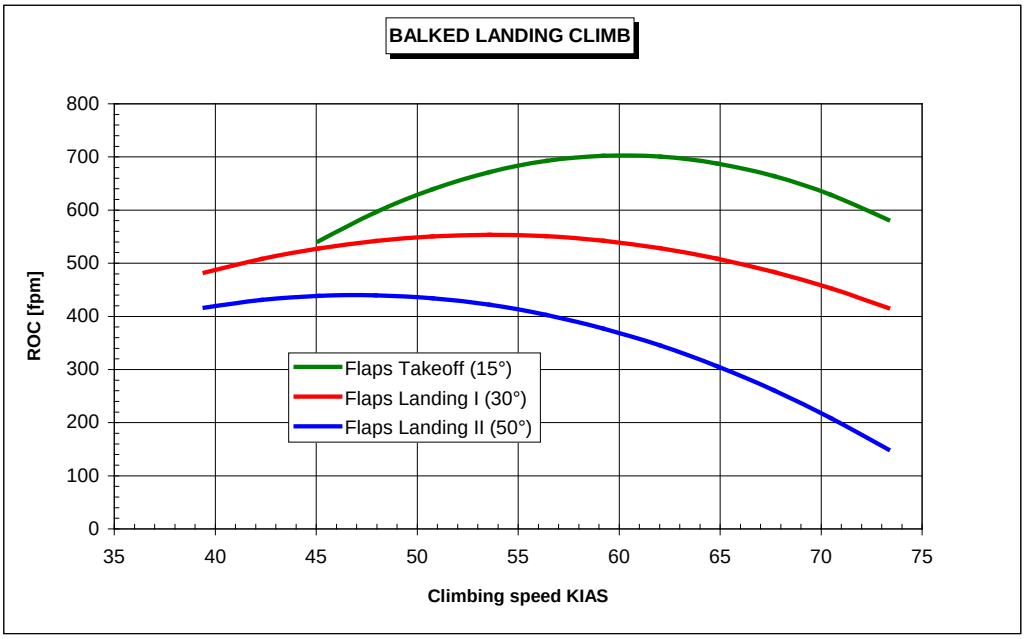
Endurance at	**10 USGAL**	[h:m]	2:41	2:01	1:50	1:30
Range at		[NM]	190	170	160	150
		[miles]	220	200	180	170

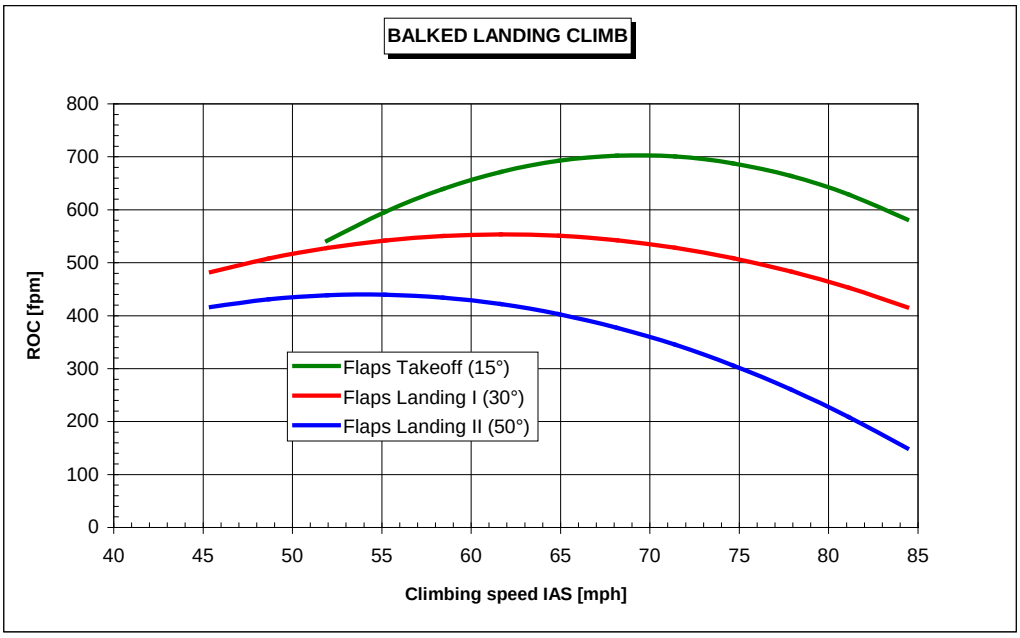
Endurance at	**5 USGAL**	[h:m]	1:20	1:00	0:55	0:45
Range at		[NM]	90	80	80	70
		[miles]	100	90	90	80

6.2.4 BALKED LANDING CLIMB

Conditions:

- Engine: Maximum take-off power
- Carburetor preheating: OFF
- Flaps: Landing position (50°)
- Airplane weight: 1320 lbs (600 kg)
- Vortex generators Along the whole span of the wing
- Ambient air temperature: ISA





6.2.5 EFFECT ON FLIGHT PERFORMANCE AND CHARACTERISTICS

Flight performances and characteristics are not considerably affected by rain or insect stuck on the airplane surface.

6.2.6 DEMONSTRATED CROSSWIND PERFORMANCE

Maximum demonstrated speed of wind at airplane operation	24 kts (28 mph)
Maximum demonstrated speed of cross wind for take-off and landing	
- Beginners and average pilots	10 kts (12 mph)
- Experienced pilots	15 kts (17 mph)
Maximum demonstrated speed of tail wind	6 kts (7 mph)

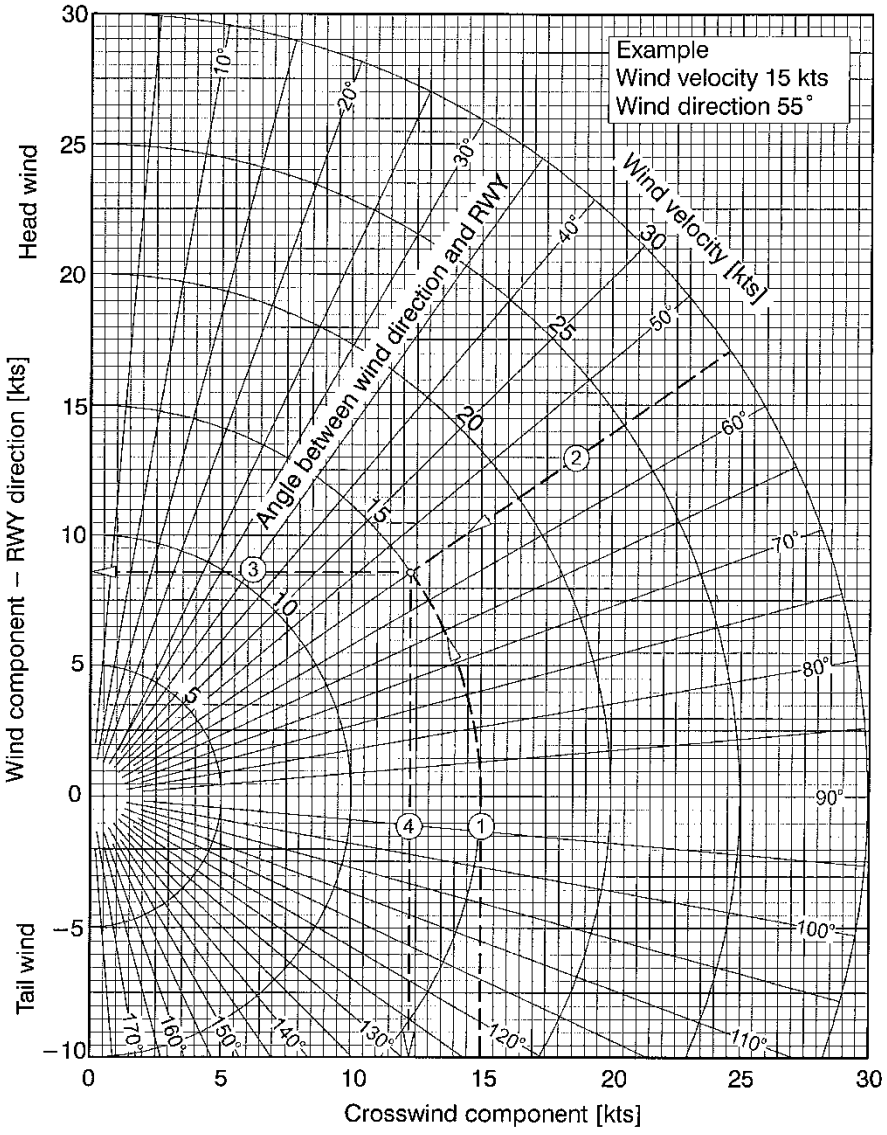


Figure 5–1 Influence of wind on take-off and landing

6.2.7 CEILING

Service ceiling (ROC 100 fpm) 13 000 ft

6.2.8 NOISE DATA

Not measured.

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7.1 Introduction

This Section includes Weight and Balance Record of empty airplane, Permitted Payload Range within which the airplane may be safely operated, and a method to determine whether the operational weight and CG location will be within the permitted limits range.
Procedure for weighing the airplane and the calculation method for establishing the permitted payload range are contained in the Aircraft Maintenance and Inspection Procedures for the SportStar MAX Light Sport Aircraft.

6.2 Weight and Balance Record

Type	SportStar MAX	Serial. No.:	Weight change						Basic weight of empty airplane	
			Added (+)			Removed (-)				
			Weight (lb)	Arm (in)	Moment (lb.in)	Weight (lb)	Arm (in)	Moment (lb.in)	Weight (lb)	Moment (lb.in)
Date	Item No. -	Description of part or modification								
	Item No. +	Manufactured airplane								

6.3 Permitted Payload Range

MAXIMUM WEIGHT OF CREW [lb]				Airplane S/N:			20080610			MTOW [lb]:	1320
Date	Empty weight [lb]	C.G. [% MAC]	Fuel volume gauge	1,0	0,8	0,6	0,4	0,3	0,2	Date	Signature
			Fuel volume [USGal.]	30	25	20	15	10	5		
			Fuel weight [lb]	180	150	120	90	60	30		
6.3.2009	780	19,18	BAGGAGE [lb] 55	305	335	365	395	425	455		
			28	332	362	392	422	452	482		
			0	360	390	420	450	480	510		
			55								
			28								
			0								
			55								
			28								
			0								

6.4 Operational Weight and Balance Computation

An important part of preflight planning is to determine that the aircraft is loaded so its weight and CG location are within the allowable limits.
This is possible by using hereafter explained Loading graph method, using weights, arms, and moment indexes.

6.4.1 COMPUTATIONAL PROCEDURE

1. Record into the **Airplane Loading Schedule Chart** current empty weight and static moment of the airplane, which you read from the table 6.2 Weight and Balance Record.
2. Record the weight of crew, fuel, and baggage into the **Airplane Loading Schedule Chart.**
3. See the **Table of Static Moments** or **Airplane Loading Graph** to read static moments for given weights of crew, fuel, and baggage
4. Record found moments into the **Airplane Loading Schedule Chart**
5. Determine Take-off weight of the airplane – add together the airplane empty weight, crew, fuel, and baggage and record the result into the **Loading Schedule Chart**.
6. Check, whether the calculated Take-off weight does not exceed Airplane Maximum Take-off Weight 1320 lb.
   If yes, then it is necessary to reduce weight of some of the useful load items (fuel, baggage).

WARNING

EXCEEDING MTOW MAY LEAD TO DETERIORATION OF SAFETY OF FLIGHT!

7. Determine Total Static Moment of loaded airplane – add together the static moment of empty airplane, crew, fuel, and baggage and record the result into the **Loading Schedule Chart**.
8. Plot Takeoff Weight and Total Static Moment into the **SportStar MAX CG Moment Envelope**.
9. Check, whether the intersection of Take-off weight horizontal line and Total Static Moment vertical line is inside the envelope.
   If **YES**, then the flight may be safely performed as regards weight and balance.
   If **NOT**, then it is necessary to change weight of some of the useful load items (crew, fuel, baggage) so that after a repeated computation the intersection of Take-off Weight and Total Static Moment will be inside the CG Moment envelope.

WARNING

SAFETY OF FLIGHT PERFORMED WITH THE AIRPLANE LOADED OUTSIDE PERMITTED LIMITS OF WEIGHT AND STATIC MOMENTS MAY BE DETERIORATED!

7.5 Airplane Loading Schedule Chart

Type / Model	SportStar MAX	Serial No.:		Registration:	

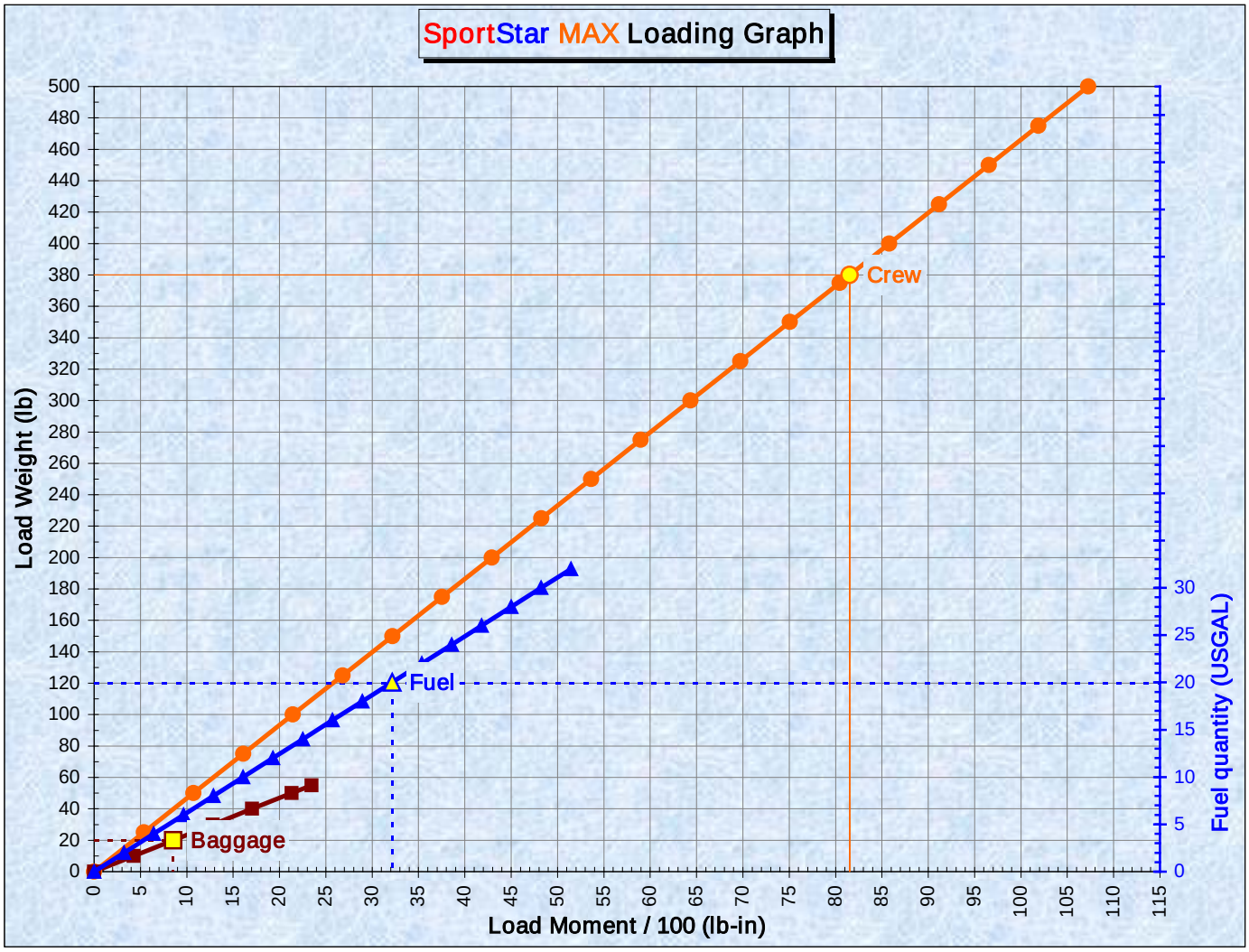
Loading Schedule Chart							
Your Aircraft			Sample Aircraft			Your Aircraft	
No	Item	Arm * *(in)*	Arm *(in)*	Weight *(lb)*	*Moment/100 (lb-in)*	Weight *(lb)*	*Moment/100 (lb-in)*
1.	**Empty Airplane**		*10,39 in*	*740,75 lb*	*77,1 lb-in*		
2.	**Crew**	*21,45 in*		*399,04 lb*	*85,6 lb-in*		
3.	**Baggage** (Max. *55 lb*)	*42,65 in*		*11,02 lb*	*4,7 lb-in*		
4.	**Fuel** (Max. *32 USGAL*)	*26,75 in*		*60,41 lb*	*16,2 lb-in*		
5.	Take off weight = Sum of weights 1-4 (MTOW 1268 lb) Total moment = Sum of moments 1-4			***1211 lb***	***184 lb-in***		

*) – for your empty airplane arm see Weight and Balance Record delivered with your airplane

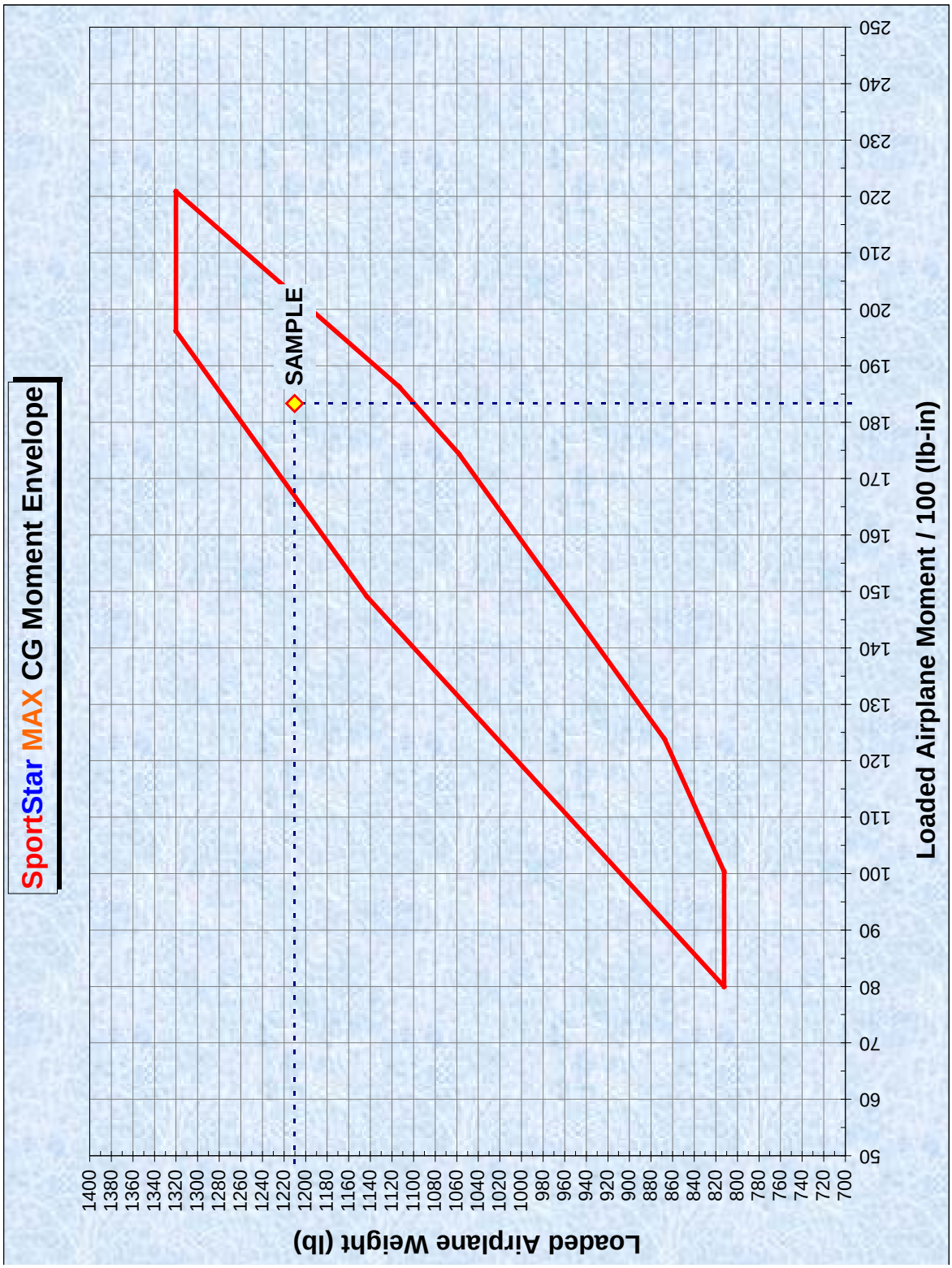
7.6 Table of Static Moments

CREW		BAGGAGE		FUEL		
Weight (lb)	Moment/100 (lb-in)	Weight (lb)	Moment/100 (lb-in)	Quantity (USGAL)	Weight (lb)	Moment/100 (lb-in)
0	0,0	0	0,0	0,0	0,0	0,0
100	21,5	2	0,9	1,0	6,0	1,6
120	25,7	4	1,7	2,0	12,0	3,2
140	30,0	6	2,6	3,0	18,0	4,8
160	34,3	8	3,4	4,0	24,0	6,4
180	38,6	10	4,3	5,0	30,0	8,0
200	42,9	12	5,1	6,0	36,1	9,6
220	47,2	14	6,0	7,0	42,1	11,3
240	51,5	16	6,8	8,0	48,1	12,9
260	55,8	18	7,7	9,0	54,1	14,5
280	60,1	20	8,5	10,0	60,1	16,1
300	64,4	22	9,4	11,0	66,1	17,7
320	68,6	24	10,2	12,0	72,1	19,3
340	72,9	26	11,1	13,0	78,1	20,9
360	77,2	28	11,9	14,0	84,1	22,5
380	81,5	30	12,8	15,0	90,1	24,1
400	85,8	32	13,6	16,0	96,1	25,7
420	90,1	34	14,5	17,0	102,1	27,3
440	94,4	36	15,4	18,0	108,2	28,9
460	98,7	38	16,2	19,0	114,2	30,5
480	103,0	40	17,1	20,0	120,2	32,2
500	107,3	42	17,9	21,0	126,2	33,8
520	111,5	44	18,8	22,0	132,2	35,4
540	115,8	46	19,6	23,0	138,2	37,0
560	120,1	48	20,5	24,0	144,2	38,6
		50	21,3	25,0	150,2	40,2
		52	22,2	26,0	156,2	41,8
		54	23,0	27,0	162,2	43,4
		55	23,5	28,0	168,2	45,0
				29,0	174,3	46,6
				30,0	180,3	48,2
				31,0	186,3	49,8
				32,0	192,3	51,4

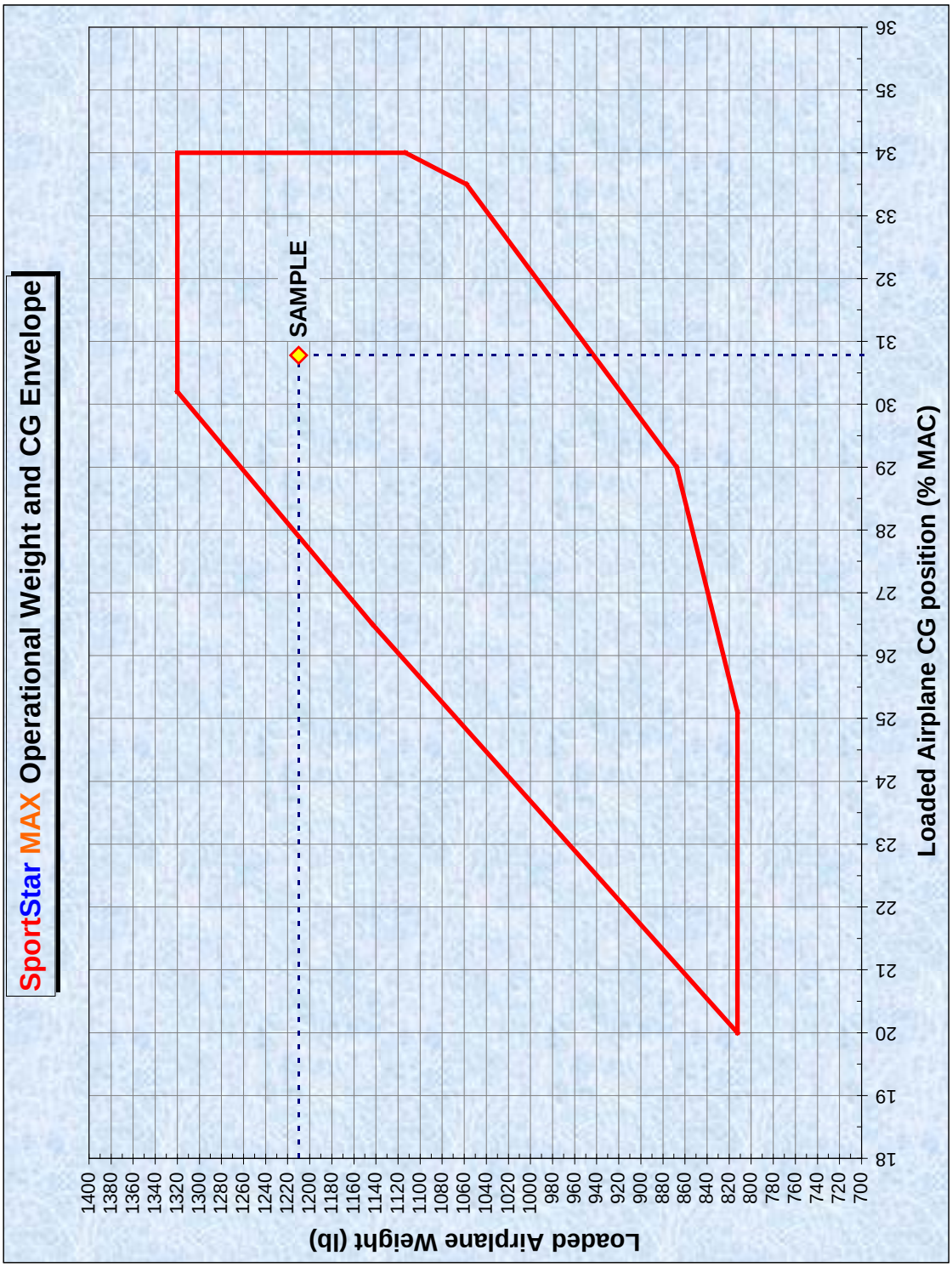
7.7 Airplane Loading Graph



7.8 CG Moment Envelope



7.9 Operational Weight and CG Envelope



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7.1 Introduction

This section describes systems of the airplane and its operation.

7.2 Airframe

The airframe of the SportStar MAX airplane is a combination of a semimonocoque structure consisting of metal reinforcement, frames and duralumin sheet skin, with a composite back side of fuselage and composite canopy.

7.2.1 FUSELAGE

The fuselage is a combination of semimonocoque structure consisting of reinforcements and duralumin skin, with a composite back side of fuselage and composite canopy . Fuselage section is rectangular in the lower part and elliptic in the upper part. The fin is an integral part of fuselage. The cockpit for two-member crew is located in the middle part of the fuselage that is accessible after uncovering the single-piece organic glass composite canopy. The engine compartment in the front part of the fuselage is separated from the cockpit by the steel firewall to which the engine bed is attached.

7.2.2 WING

The wing is of a rectangular shape, single-spar structure with the auxiliary spar with suspended ailerons and split wing flaps. Riveting is used for connecting individual structural elements. Fiber-glass wing tips are riveted on the wing ends. There is an integral fuel tank inside each wing half, in the section between the main and auxiliary spar at the wing root.

7.2.3 HORIZONTAL TAIL UNIT (HTU)

The VTU of conventional type consists of the stabilizer and elevator with the trim tab. Single-spar structure of HTU consists of duralumin ribs, spar and skin. Top view of HTU is of rectangular shape.

7.2.4 VERTICAL TAIL UNIT (VTU)

VTU is of trapezoidal shape. Its fin is an integral part of the fuselage. The rudder is suspended on the fin by means of two hinges. The VTU structure consists of the duralumin spar and skin.

7.3 Control

Airplane control consists of ailerons, elevator and rudder. Directional control is connected by means of pull rods with nose landing gear control. Main landing gear brakes are controlled by pedals of directional control.

Airplane is equipped with dual control enabling flight with two-member crew.

7.3.1 LONGITUDINAL CONTROL

Longitudinal control is actuated by the control stick. Longitudinal movement of control stick is transferred to the elevator by mechanical system of pull rods and levers.

7.3.2 LATERAL CONTROL

Lateral control is actuated by the control stick. From the control stick the movement is transferred through the system of levers and pull rods to ailerons.

7.3.3 RUDDER CONTROL

Rudder control is controlled by pedals of foot control. The rudder is interconnected with foot control pedals by cable system.

Foot control pedals adjustable into three positions can be installed as an option.
Way of adjustment of rudder pedals:

1. Release the pin from the adjusting groove by pressing lever.
2. Set pedal to required position and release lever.
3. Check on the pin locking-on in the adjusting groove

WARNING

RIGHT AND LEFT PEDAL OF RUDDER CONTROL MUST BE ADJUSTED IN THE SAME POSITIONS AND SECURED!

7.3.4 ELEVATOR TRIM TAB CONTROL

The elevator trim tab is controlled by the lever located in between the pilot seats. The control lever is interconnected with the trim tab by means of Bowden-cables.

7.3.5 AILERON TRIM TAB CONTROL

Electric aileron trim tab control can be installed optionally. Control switches are located on the control stick, trim tab position indicator is located on the instrument panel.

7.4 Controls In Cockpit

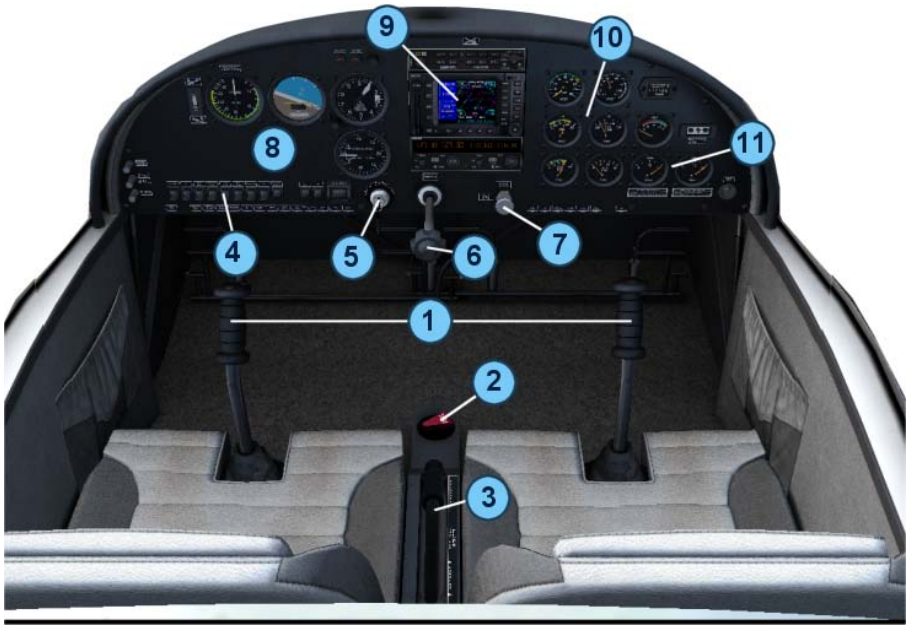


Fig. 7.1 Cockpit Controls

1. Control Stick
2. Fuel Selector
3. Flaps Control
4. Electrical/Light Switches
5. Ignition
6. Throttle Knob
7. Choke
8. Primary Instruments *
9. GPS/Avionics **
10. Engine Instruments
11. Fuel Indicators

* **Primary Instruments**
ADI - Artificial Horizon
Gyro
Airspeed Indicator
Altimeter
Vertical Speed Indicator

** **Avionics**
Audio Panel/Marker Beacons
GNS 480 GPS/WAAS/NAV-COM 1
NAV-COM 2 Radio

7.5 Instrument panel

Instrument panel is shown in Fig. 7.1.

7.6 Markings and placards

See Section 2 - Limitations and Markings.

7.7 Landing gear and brakes

7.7.1 LANDING GEAR

The airplane is equipped with a fixed nose landing gear. Main landing gear legs are produced from composite spring. Nose landing gear leg is welded from two pieces - the tube and the yoke- in which the nose wheel is mounted. The nose landing gear is spring-loaded by a rubber rope. The nose wheel is steerable, wheel control is coupled with rudder control by means of two pull rods. Wheels can be fitted with fiber-glass aerodynamic pants.

7.7.2 BRAKES

The SportStar MAX airplane is equipped with disk hydraulic brakes on main landing gear wheels. Brake system is composed of toe-brake pedals (these are a part of rudder control pedals), brake pumps, brake fluid reservoir, brake fluid central bottle on the firewall, hoses for leading brake liquid, brake yokes with wheel cylinders and brake pads. By depressing the brake pedals compression of the brake pumps will occur, which generates pressure in the brake circuit and hydraulic cylinders press the brake pads onto the brake disks. Braking pressure can be regulated only by the force applied to the brake pedals.

7.8 Seat and safety harnesses

The SportStar MAX is a two-seat airplane with side-by-side seats. The seats are fixed, non-adjustable, and fitted with light upholstery.

Each of the seats is fitted with a four-point safety harness which is composed of safety belts, shoulder straps and lock. The safety harness is anchored in the fuselage sides behind the seats and on the seat sides.

7.9 Baggage compartment

The baggage compartment is positioned behind the seat rests. The maximum weight of the baggage compartment is 55 lbs (25 kg), as stated on the placard in the baggage compartment.

The baggage compartment is fitted with rubber net for baggage fixation.

WARNING

It is prohibited to use a space behind baggage compartment for additional stowage. This is due to airplane aft C.G. limit.

7.10 Canopy

The cockpit canopy is of a teardrop shape. The framework is composed of composite structure on which the organic glass canopy is stuck.

The canopy is attached to the fuselage in the front part by two swivel pins by means of which it can be moved forward. In order to make opening easier, the actual weight of canopy is balanced by two gas struts.

7.10.1 LOCK

The canopy is provided with an automotive lock in the rear upper part of the tip-up frame and key lock on the top of rear fixed frame.

Maintenance of automotive lock: Spray the lock with WD-40 spray annually from time to time

Adjustment: Release the socket wrench screws on back of the lock, adjust lock position and tight the socket wrench screws

7.11 Power unit

7.11.1 GENERAL

The ROTAX 912 ULS (100 hp) engine is used to power SportStar MAX airplane.

The ROTAX 912 is a four-cylinder, four-stroke engine with opposite cylinders, central cam shaft and OHV valve mechanism.

The on-ground adjustable, composite, 3-blade propeller WOODCOMP KLASSIC 170/3/R is mounted on the engine.

7.11.2 ENGINE CONTROL

Engine power is controlled by means of the THROTTLE knob, which is located in the middle of the instrument panel. It controls the engine power range from idle up to maximum take-off. The engine power controller is mechanically interconnected with the flap on the carburetors.

If the lever is fully pushed in, this position corresponds to maximum engine power. If the lever is fully pulled out, this position corresponds to idle.

7.11.3 ENGINE INTRUMENTS

The following analog instruments (Fig. 7-1 #10) are located on the instrument panel for monitoring engine performance.

1. **RPM indicator** - Working range of the RPM indicator is 0 - 6000 RPM.
2. **Manifold Pressure** - Working range 0-40 PSI
3. **Oil Temperature -** Working range of oil thermometer is 120 ÷ 300°F.
4. **Cylinder Head Temperature** - The cylinder head thermometer transmitter senses temperature of cylinder No. 3. Working range of the cylinder head thermometer is 120 ÷ 300°F.
5. **Oil Pressure** - Working range is 0 ÷ 150 PSI.
6. **Fuel Pressure** - Working range 0-15 PSI

7.11.4 ENGINE COOLING SYSTEM

Engine cooling is combined, cylinder heads are cooled by water, cylinders are cooled by air. Cooling circuit of cylinder heads is designed as a closed system containing pump, expansion reservoir (1) with pressure closure (3), cooler of cooling liquid (2) and drainage reservoir (4). Scheme of cylinder head cooling system is shown in Fig. 7–2.

When changing, the cooling liquid is filled up through the cap of expansion reservoir (1), during airplane operation it is replenished into drainage reservoir (4) between the lines of maximum and minimum level.

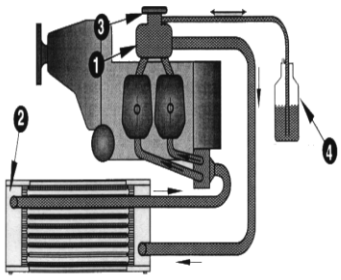


Figure 7–2 Scheme of cylinder head cooling system

7.11.5 ENGINE LUBRICATION SYSTEM

The engine lubrication system is performed with the dry crank case. The engine lubrication system is equipped with an oil pump (1) ensuring oil feeding from the reservoir (4) located on the fire wall through the oil cooler (5) and the oil cleaner (6) to the lubricated points of engine. The pressure sensor (2) is located behind the oil pump. The oil reservoir is aerated by the hose (7) which is led under the airplane. Oil pressure and temperature are indicated on instruments in right side of the instrument panel. Oil is replenished through the lid in the upper part of the oil reservoir.

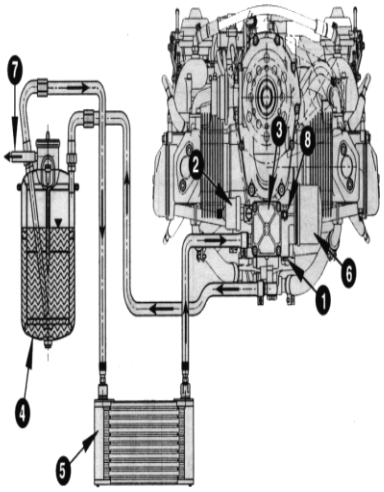


Figure 7–3 Scheme of engine lubrication system

7.11.6 ENGINE INTAKE SYSTEM

The engine intake system ensures delivery of sufficient air into engine. Air is taken into the engine through openings on the engine covers through the air filters.

The intake system is equipped with a carburetor heating system. Hot air from the heat exchanger (located on the exhaust collector) is taken to the mixing chamber. Amount of in-taken hot air is regulated by flaps in mixing chamber inlets. Flaps are controlled by the CARBURETTOR PREHEATER knob on the left side of the instrument panel.

7.11.7 IGNITION SYSTEM

The engine is equipped with the double contactless ignition system. Each ignition circuit has own source of energy, control unit, 2 ignition coils and 4 spark plugs. It is fully autonomous on the other circuit of accumulator. High voltage current is distributed to the spark plugs through high-voltage cables. Ignition sequence of individual engine cylinders:

Ignition circuits are controlled by the ignition switch on the instrument panel.
Positions of ignition switch:

OFF	Engine ignition is off
R	Only ignition circuit B is on
L	Only ignition circuit A is on
BOTH	Both circuits are on
START	Both circuits are on and starter is cranking the engine

7.12 Fuel system

The Fuel system maintains fuel flow into the engine. The fuel system of the SportStar MAX airplane is composed of integral fuel tanks, fuel line, fuel selector, fuel filter, mechanical fuel pump - located on the engine (auxiliary electrical fuel pump can be installed), a distribution pipe for delivery of fuel to the engine, with a fuel return branch, fuel gauges and fuel tank drain valves.

7.12.1 FUEL TANKS

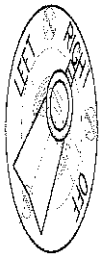
Fuel is stored in the wing integral tanks. Each tank is fitted with air venting (output is under the wing tip) and a drain valve on the bottom side of the wing. Fuel is led from the tanks through the hoses to the fuel selector located on a central console under the instrument panel and then through a fuel filter to the engine pump and carburetors. A fuel return hose goes from the fuel pump into the left tank, which is considered the “primary” tank. See figure 7-4 for a schematic of the fuel system.

7.12.2 FUEL SELECTOR

The fuel selector (Fig. 7-1 #2) controls fuel tank selection and fuel delivery interruption in case of engine fire or airplane parking.

To move the selector from the OFF (closed) position turn the handle from the OFF position to the left. The handle can be freely moved between LEFT and RIGHT position.

Move the selector to the OFF (closed) position to block fuel flow to the engine.



7.12.3 FUEL FILTER

The fuel filter separates all mechanical impurities from fuel. The fuel filter is under the cockpit on the left airframe panel.

7.12.4 INDICATION OF FUEL QUANTITY

Fuel quantity is measured by a float fuel gauge transmitter in each tank and indicated on the fuel gauges on the instrument panel. ⇨

The left hand fuel gauges indicates fuel quantity in the left (primary) tank, the right hand indicator shows fuel level for the right tank.

True fuel quantity is indicated only on ground and in level flight and it takes approx. 2 minutes to level fuel after transition from climb/descent.

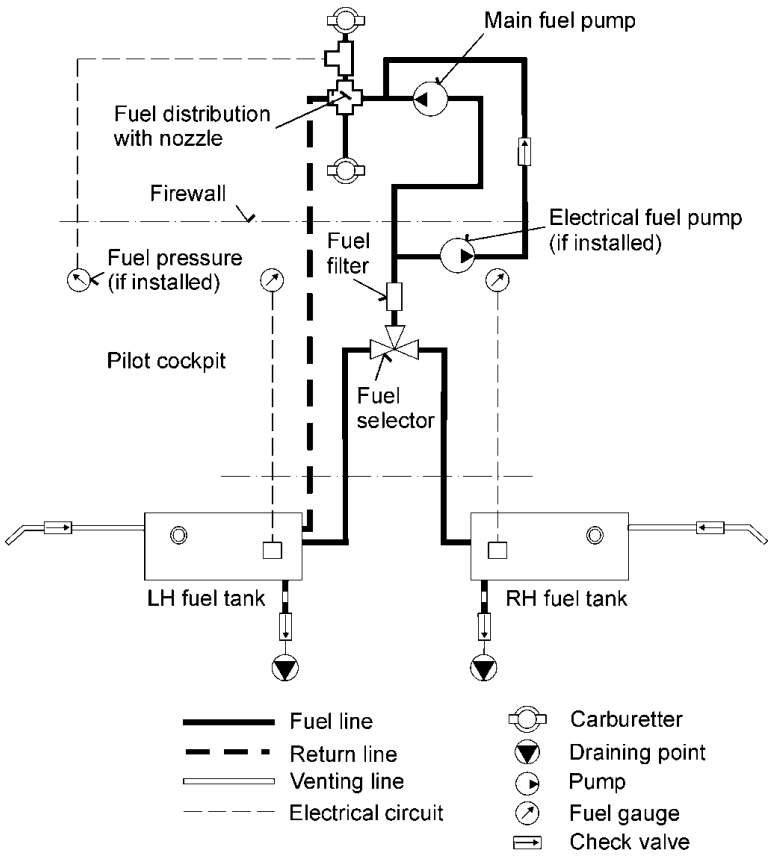


Figure 7–4 Scheme of fuel system

7.13 Electrical system

The airplane is equipped with a 14 Volt DC electrical system. A 250 Watt generator, feeding by a drive belt from the engine, is the primary source of electrical energy. The secondary source of energy is the 12V/16Ah battery that is located in the engine compartment on the firewall. It is used for engine starting and in case of generator failure as an emergency source of energy and also serves as the smoothing filter of power system.

DC voltage is distributed to individual systems by the main bus bar. Each system is protected by a circuit breaker. In case of circuit overload the circuit breaker pops out.

CAUTION

DO NOT USE CIRCUIT BREAKERS FOR NORMAL SWITCHING OFF OF THE SYSTEMS

After switching the MASTER SWITCH on and by turning the ignition key to the START position the starter is activated. The starter is power supplied from the accumulator before engine start. After the engine has been started and idle RPM reached, generator starts supplying current into electrical network.

7.13.1 LIGHTING

The airplane is equipped with an external lighting.

External lighting is composed of position lights and anti-collision beacons which are located in wing tip and landing headlight which is located in left wing leading edge or in the lower engine cowling.

The lights are switched by the POS. LIGHTS switch on the instrument panel switch bank (Fig. 7-1 #4). Landing headlight is switched by the LDG LIGHT switch.

7.14 Pitot-static system

The airplane is equipped with a pitot-static tube for sensing static and total pressure. It is located under the left half of the wing. Total pressure is sensed through the opening in the Pitot-static tube face. Static pressure is sensed through openings on the tube circumference. The system of static air pressure distribution to individual instruments is provided by means of flexible plastic hoses. Transparent drain reservoirs are located in the pressure branch of static and total pressure on the left fuselage side on the bottom next to wing leading edge.

Static pressure is led to altimeter, airspeed indicator, and altitude encoder. Total pressure is led only to the airspeed indicator. The pitot tube is heated.

For scheme of IFR pitot-static system refer to IFR Supplement to this AOI.

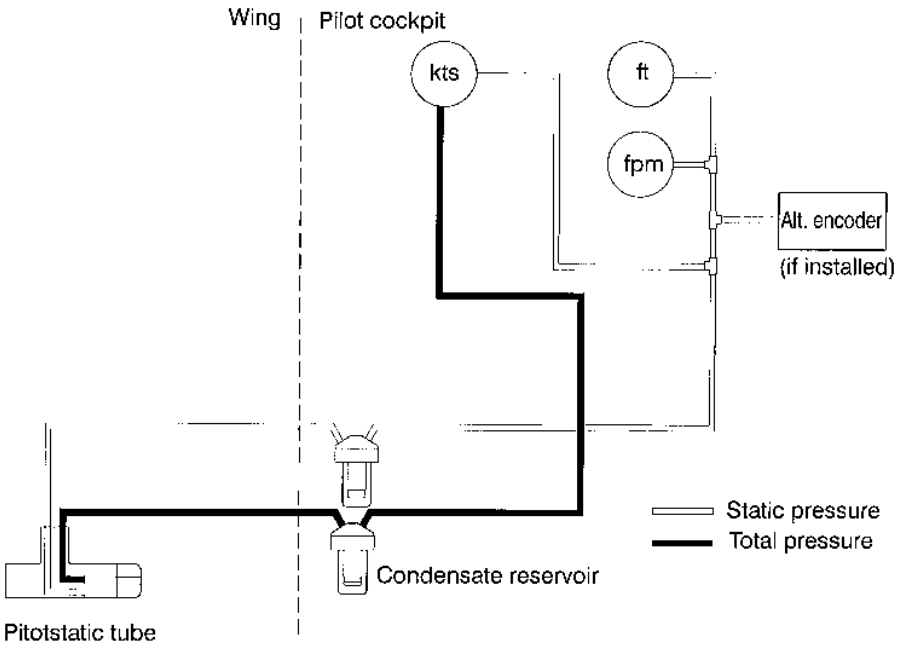


Figure 7–5 Scheme of pitot-static system

7.15 Supplementary equipment

7.15.1 VENTILATION AND HEATING SYSTEM

Cockpit ventilation is ensured by 2 vents located on the left and right of the tip-up canopy frame. Vents are connected to the NACA scoops through tip-up canopy frame front flaps.

Cockpit heating is provided by air conducted through a hose guided from a fiberglass collector behind the engine radiator into the heat exchanger and then into the mixture flap on the firewall and further through a directional flap to the cockpit floor or to the hot air outputs through the instrument panel cover as well as into the hollow spaces of the tip-up frame for defrosting. Hot/cold air temperature is regulated by the **HOT AIR** knob on the instrument panel.

Defog / defrosting of windshield and sides is ensured by hot air conducted from a cold/hot air mixture flap on the firewall into the tip-up canopy frame and then through a row of holes onto the glass.

7.16 Navigation and communication equipment

Please refer to the respective Pilot Handbooks for the GNS 480 and NAV/COM radio.

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