

ALLEGRO[®] 2007

Light Sport Aircraft

Special Light Sport Aircraft



Pilot's Operating Handbook

Model Number 2007
Aircraft Registration Number _____
Engine Type _____
Propeller-Type _____

Serial Number _____
Serial No. Engine _____
Serial No Propeller: _____

Month/Year ____/____
of Construction

ATC Designation: ALGR

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1 General Information

1.1 Introduction

This Operation Handbook is designed to help enable a safe and successful completion of each flight with the Allegro®. It provides you with all necessary information for regular maintenance and operation of the aircraft. Therefore we recommend that the pilot keeps this Operating Handbook upgraded with the newest information available. You can get the newest version of this Handbook from your local dealer or directly from the distributor emailed to you. Send your email to: info@B-Bar-Daviation.com

Certification

Fantasy Air Ltd.. confirms that the Allegro® 2000 and Allegro® 2007 models comply to the specifications of the Light Sport Aircraft and the ASTM consensus standards.

Quick Reference

Referenced Documents *ASTM Standards*

F 2339

Practice for Design and Manufacture of Reciprocating Spark Ignition Engines for Light Sport Aircraft

FAR-33

Airworthiness Standards: Aircraft Engines

F 2245 – 07

Standard Specification for Design and Performance of a Light Sport Airplane

F2295-06

Standard Practice for Continued Operational Safety Monitoring of a Light Sport Aircraft

F 2279 – 06

Standard Practice for Quality Assurance in the Manufacture of Fixed Wing Light Sport Aircraft1

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1 General Information

1.1 Introduction to Aircraft

The Allegro® SLSA is an all metal wing, t-tail and rudder with a Kevlar® composite fuselage with 2-place side by side seating aircraft. The aircraft is designed in accordance to ASTM F-2245-07 Light Sport Aircraft design standards.

The landing gear is of tricycle style with hydraulic brakes and a fully steerable nose wheel. The nose wheel is hardened with rubber shock bushing suspension system. The main gear are a laminated composite structure.

The following list is the general features of Allegro 2007 SLSA aircraft:

- All materials aircraft grade. All hardware AN grade or equivalent.
- All metal construct for wing, t-tail and rudder using aircraft grade aluminum and steel.
- Kevlar®, foam and fiberglass composite fuselage
- Standard Rotax 912 (80 hp), non-certified, ASTM compliant engine.
- Klassic 160 propeller from Woodcomp Propeller Company.
- Single center stick configuration
- Articulating hydraulic located on the center stick
- Dual throttle
- Electric flaps with instrument panel indicator
- 4 point airline style turn buckle seat belts
- Adjustable Tract system for both seats
- Heavy duty landing gear
- Steerable nose wheel
- Available in a variety of designs

Standard Equipment: Radio/Intercom, Cabin Heat, Wheel Pants, Nav Lights, Wing strobe lights Tail Strobe Light, Landing Light, Halogen wingtip Lights, Window Vents, **EMS***, Stall speed indicator Locking Cabin, Hour Meter, Rotax 912 (80 hp), Hydraulic disc brakes, Electrical Flap Control, Carpet & Upholstery in Cockpit, Composite Three Blade WoodComp Propeller, Choice - Color Design ELT (Emergency Locator Transmitter), Electric Fuel Pump, Quick Release Drain Valve

***ENGINE GAUGES:** RPM Tachometer, CHT, Oil Temperature, Oil Pressure, EGT's
Fuel Pressure
Airspeed Indicator
Altimeter Indicator
VSI
Compass
Fuel Level
Flap Indicator
Bank Indicator

1 General Information

1.2 Performance and Recommended Speeds

TOTAL WEIGHT OF THE AIRCRAFT (lbs)	835 Lbs	1320 Lbs
Take-off	41 MPH	46 MPH
Climbing Speed	70 MPH	70 MPH
Landing Approach Speed	70 MPH	70 MPH
Maximum Rate of Climb with Rotax 912 80hp	1000 fpm	1000 fpm

Stall Speed at maximum take-off weight 1320 lbs. - level flight

Wing Flaps Position	Engine Power Output	Stall Speed	
		IAS MPH	CAS MPH
0	Engine at idle	53 MPH	51 MPH
1	Engine at idle	48 MPH	47 MPH
2	Engine at idle	45 MPH	44 MPH

Limiting Wind Speeds

Maximum Demonstrated Headwind Speed 23 mph
(i.e. against the direction of the flight)

Maximum Demonstrated Crosswind Speed 12 mph
(i.e. perpendicular to the direction of the flight)

Do not try to take off or land with the tail-on wind except for emergencies!

Caution All above mentioned IAS speeds values were measured at a company aircraft test flights made on June 19, 2006 on the airfield Pisek-Krasovice Elevation 1351 ft, air temperature: + 81F

CAUTION With any aircraft flying in different condition, i.e.. Different altitudes above sea level and different air temperatures, the listed values can differ!

- Optimum Cruise Speed (Vopt) 90-120 MPH
- Economical Cruise Speed (Vecon) 90 MPH
- Best rate of climb speed (Vy) 70 MPH
- Power Off Glide Ratio (with engine off) 12:1
- Power Off Descent Rate (68 MPH, flaps position 0) 600 ft/min
- Power Off Descent Rate (68 MPH, flaps position 1) 800 ft/min
- Power Off Descent Rate (68 MPH, flaps position 2) 1400 ft/min
- Fuel Consumption at the Cruise Speed of 85 MP Hand Maximum Weight 1320 lbs. (Alt 2000ft MSA) 2.5 Gal. per hour

1 General Information

· Flight Range economical cruise	5 hour 30 min
· Take-off distance MSL, 60°, wind 0, MTOW 1320lbs.	300 feet
· Take-off distance over 49 ft. obstacle	
o With engine Rotax 912 80 hp 1320 lbs	930 feet
o With engine Rotax 912S 100 hp 1320 lbs.	810 feet
· Landing distance	340 feet
· Landing over 49 ft. obstacle	721 feet

Caution The take-off distance is longer with higher temperatures and higher altitude!

1 General Information

1.3 Gross Weight

*Weights - Allegro® 2007 *weights shown with Rotax 912 (80hp)***

Maximum Take-off Weight	1320 Lbs
Empty Weight	647 Lbs
Maximum useful load	673 Lbs

Weights - Allegro® 2000 with Rotax 912 (80 hp)

Maximum Take-off Weight	1232 Lbs
Empty Weight	638-642 Lbs
Maximum useful load	594-590 Lbs

****Weights shown without ballistic recovery system**

1.4 Speed

Top speed at sea level and cruise speed at a stated power setting & altitude
(All stated MPH and RPM must be factored with wind and density altitude)

At 5000 ft,	cruise speed	122 mph	5500
At 5000 ft	75% cruise	110 mph	4800 to 5300 RPM

1.5 Fuel Range

Full fuel range with reserves at a stated power setting and altitude** (all number based on Rotax 912 (80 ph))

Fuel consumption at takeoff power (5800 RPM) 6.1 GPH
Fuel consumption at maximum power (5500 RPM) 4.6 GPH
Fuel consumption at 75% cruise power (5000 RPM) 4.0 GPH

Allegro 2007	450 Miles	Total 17 gal	Usable 16.5 gal	Reserve 2 gal
Allegro 2000	360. miles	Total 14 gal	Usable 13.5 gal	Reservie 2 gal

1.6 Rate of climb (V_x to V_y) for 2000 and 2007

Best angle of climb/speed	70 mph
Best rate of climb/speed	75 mph

1 General Information

1.7 Stall Speed

Stall Speed at maximum take-off weight 1320 lbs. - level flight

Wing Flaps Position	Engine Power Output	IAS MPH	Stall Speed	
			CAS MPH	
0 (-4.0°)	Engine at idle	53 MPH	51 MPH	
1 (+15°)	Engine at idle	48 MPH	47 MPH	
2 (+48°)	Engine at idle	45 MPH	44 MPH	

Maximum Level Speed with extended flaps VFE = 70 MPH

Caution - Do not exceed this speed with extended flaps!

1.8 Total fuel capacity, total usable fuel and approved types of fuel

Allegro® 2000 Fuel capacity 14.5 gallons capacity with 14 gallons usable

Allegro® 2007 Fuel capacity 17 Gallons capacity with 16.5 gallons usable

Allegro ® 2000 & 2007 with Rotax 912 - 80 hp Gasoline 87 Octane
100 Low Lead AvGas

Allegro @2000 and 2007 with Rotax 912S - 100 hp Gasoline 93 Octane
100 Low Lead Avgas

1.9 Maximum engine power output at a stated RPM

Rotax 912 (80 hp)	81 hp @ 5800 RPM
Rotax 912S (100 hp)	100 ph @ 5800 RPM

2 Limitations

2.1 Airspeed Indicator

Mark	Range – Value [IAS MPH]	Meaning
white curve	45-70	Operating range with flaps out
green curve	55-90	Standard operating range
yellow curve	90-136	Maneuvering must be done carefully and in calm conditions
red radial line	138	Maximum speed for all operations

Engine gauges must have the scales marked according to the requirements of the manufacturer.

V_A	Design maneuvering speed at gross weight	90 mph
V_A	Design maneuvering speed at minimum weight	90 mph

2.2 Stalling speeds at maximum takeoff weight (V_s and V_{so})

V_s	Stalling speeds or minimum steady flight speed at which airplane is controllable (flaps retracted)	50 mph
V_{so}	Stalling speed or minimum steady flight speed at which the airplane is controllable in the landing configuration (flaps fully deployed)	42 mph

2.3 Flap extended speed range (V_{so} to V_{FE})

V_{so}	Stalling speed or minimum steady flight speed at which the airplane is controllable in the landing configuration (flaps fully deployed)	42 mph
V_{FE}	Maximum flap extended speed	70 mph

2.4 Maneuvering speed (V_A) at gross weight and minimum weight

90 pmh

2.5 Never exceed speed (V_{NE})

138 mph

2 Limitations

2.6 Service Ceiling

15,000 feet - Note: Sport Pilot Rules limit ceiling to 10,000 ft

2.7 Load Factors (operational)

Maximum positive load factor in the centre of gravity + 4.0 g

Maximum negative load factor in the centre of gravity - 2.0 g

2.8 Approved Maneuvers

All maneuvers required and listed in the practical sport and private pilot exam.

**AEROBATIC MANEUVERS AND INTENTIONAL SPINS
ARE NOT AUTHORIZED.**

2.9 DUPLICATION OF 1.8

Total fuel capacity, total usable fuel, and approved types of fuel

Allegro® 2000 Fuel capacity 14.5 gallons capacity with 14 gallons usable

Allegro® 2007 Fuel capacity 17 Gallons capacity with 16.5 gallons usable

Allegro ® 2000 & 2007 with Rotax 912 - 80 hp Gasoline 87 Octane
100 Low Lead AvGas

Allegro @2000 and 2007 with Rotax 912S - 100 hp Gasoline 93 Octane
100 Low Lead Avgas

2.10 DUPLICATION OF 1.9

Maximum engine power output as a stated RPM

912 (80 hp) 81 hp @ 5800 RPM

912S (100 hp) 100 hp @ 5800 RPM

2 Limitations

2.11 Applicable environment limitations, if any

Minimum demonstrated outside air temperature allowed for take-off - 13° F

Maximum demonstrated outside air temperature allowed for take-off + 120°F

2.12 Applicable VFR night or IFR use limitations, if any

ASTM standards state :VFR flight)

Night flight is available if plane is so equipped and in use by private pilot with current medical.

3 EMERGENCY PROCEDURES

3.1 General information

It is recommended that the Pilot in Command become very familiar with the emergency procedures outlined below. Failure to comply could result in a serious accident that could result in human fatalities.

3.2 Airspeeds for Emergency Procedures

Best glide speed - 70 mph

3.3 Emergency Checklist

- √ Establish 70 KIAS airspeed
- √ Verify the fuel shut off is in the ON position
- √ Verify the mag switches are in the ON position
- √ Verify the start master and avionics switches ON
- √ Verify fuel capacity
- √ Verify fuel pressure
- √ Electric fuel pump ON if no fuel pressure
- √ Throttle closed
- √ Choke closed
- √ Engage starter
- √ If engine does not start or unable to turn over, assume a major internal engine failure. Complete the **Securing Engine In Flight** and **Forced Landing** checklist.
- √ If engine turns over, slow increase throttle.
- √ If engine starts, increase throttle to desired RPM and land as soon as practical.

Emergency Communications

121,5 Mhz SQUAWK 7700
MAYDAY, MAYDAY, MAYDAY
THIS IS ident, ident, ident
Description of problem
Help required
Intentions of PIC
Location & Altitude
Heading & airspeed
Type of Plane (ALGR)
Color of plane
Number on board
Extent of injuries
Repeat ident

3 EMERGENCY PROCEDURES

3.4 Engine Fire during start

Fires on board an airplane are very serious and need immediate attention. Pilots are encouraged to execute the following procedure immediately if a fire in the engine is detected.

- Turn off the fuel supply
- Set the throttle lever fully forward and wait until the engine runs out of fuel
- Switch the ignition off
- Do not try to start the engine again
- Evacuate aircraft immediately
- ****Use fire extinguisher (if available)

3.5 Engine failure during takeoff

Push the control stick forward bring the aircraft to the best glide speed

(Note: Best glide speed at 0 flaps is 75 mph.

Best glide speed at 1 or 2 flaps is 70 mph.)

- Check the ignition, throttle lever and the fuel gauge
- Try to start the engine again
- Follow the steps described above for the case when the engine fails at the flight altitude of 500 feet above the earth or less

3.6 Loss of engine power in flight

At a low altitude

Maintain best glide speed

- Make the landing in the wind
- Set the wing flaps to the landing position (2)

At a high altitude

Trim for best glide speed

Pick a place to land and head for it

Attempt engine restart

Fule Pump ON

Verify Fuel selector ON

Apply carburetor heat if equipped

Close throttle to idle

Engage starter

Add throttle after engine starts

Report MAY DAY on 121.5 (follow emergency communications procedures)

3 EMERGENCY PROCEDURES

3.7 Emergency landing without engine power

(Fly the plane 1:12)
Airspeed to 70 KIAS
Flaps to TAKEOFF (0)
Fuel Pump ON
Landing site SELECT
Engine CHECK NO FIRE)
Cause CHECK
Fuel Pump ON
Fuel Quantity OK

Fuel Valve OPEN
Throttle IDLE
Magnitos OK
Attempt restart
Switches except master OFF
Flaps to landing (1)
Master switch OFF

3.8 Precautionary landing with engine power

(Fly the plane your glide ratio is 1:12)
Airspeed to 70 KIAS
Flaps to TAKEOFF (0)
Fuel Pump ON
Landing site SELECT

3.9 Fire in flight

- Turn off the fuel supply
- Set the throttle lever fully forward and wait until the engine runs out of fuel
- Switch the ignition off
- Do not try to start the engine again
- Land the aircraft immediately by following the steps of emergency procedures

3.10 Loss of oil pressure

Oil temperature CHECK
Temperature Normal: Land at nearest airfield
Temperature rising: Power to MINIMUM REQ'D, Land as soon as possible.
Expect engine failure, Follow procedures for Engine failure

3 EMERGENCY PROCEDURES

3.11 High oil pressure

Reduce throttle to low cruise at 4500 RPM

Land as soon as practical

3.12 Emergency Descent

Slip and/or use full flaps

Dive at V_{NE} 138 mph

3.13 Alternator failure (Regulator/Rectifier)

Turn off all unneeded electrical equipment

Land as soon as practical

3.14 Overvoltage

(This is not detectable without an AMP meter)

3.15 Inadvertent spin

Aileron neutral

Throttle to idle

Rudder FULL opposite direction of spin

Move stick forward to break the stall

Gradually pull out of the dive

Apply throttle

3.16 Inadvertent icing encounter

CHECK ALL WEATHER CONDITIONS BEFORE FLIGHT

Stay out of visible moisture

Maintain minimum speed 85 mph to prevent the build up of ice on the bottom of wings

Land as soon as practical

3 EMERGENCY PROCEDURES

3.17 Loss of primary instruments - altimeter, airspeed indicator

AILERON - procedure

Verify no obstruction to stick

Verify no obstructions to aileron rods (behind co-pilot seat)

If seat is placed too far back the co-pilot will be leaning on this rod

If no solution is found, use elevator and rudder

Land as soon as practical

ELEVATOR - procedure

Maintain speed at 85 mph or above

Adjust pitch with trim

Make approach at 4100 RPM (85 mph) with flaps up

Flair with trim (nose up) to a level attitude

Retard throttle upon touch down

RUDDER - procedure

Use very shallow banks using ailerons

Use larger than normal traffic pattern

Make stabilized approach with a long final

3.19 Emergency Communications

121.5 Mhz SQUAWK 7700

MAYDAY, MAYDAY, MAYDAY

THIS IS ident, ident, ident

Description of problem

Help required

Intentions of PIC

Location & Altitude

Heading & Airspeed

Type of plane (ALGR)

Color of plane

Number on board

Extent of injuries

Repeat ident

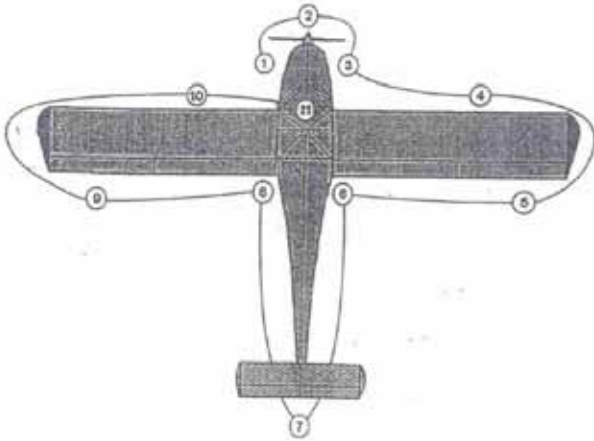
4 Normal Procedures

4.1 Preflight check

Inspection of plane

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Preflight Plane Inspection



1. Front fuselage – left side

Nose undercarriage

- Wheels axis - fixed and tightened
- Distance between tire and wheel cover – sufficient
- Tire inflation, creep marks aligned - checked
- Nose leg - nuts and split pins, damper - checked

Front cowling

- Camlocks - fixed and checked
- Obvious damages, cracks - checked
- Oil or fuel leakage - checked
- Fuel tank cap - checked
- Fuel tank cap tightness - checked

2. Front fuselage

Propeller

- Propeller cone - no cracks, clearance - checked
- Cone screws tightness – checked
- Propeller blades - no damage – checked
- Attachment screws – fixed - checked

3. Front fuselage – right side

Cowling

- Camlocks – checked
- Obvious damages, cracks – checked
- Oil and fuel leakage – checked

Engine bay

- Engine mount, and engine fixing mounts - rubber - checked
- Spark plug cable fixing - checked
- Air filter clearness - checked
- Exhaust - obvious damages - checked
- Spring and screws fixing - checked
- Engine cables and choke state control - checked
- Check oil level (at least min. on dipstick - see Rotax Manual) Holds 68 fluid oz.

4. Right wing - front part

- Wing surface leading edge deformation, damages - checked
- Dirt and water on the wing leading edge - clean up
- Wing and strut attachment screws, bolts and metal cover - checked
- Fixing control - checked
- Fittings of spar fixing - checked
- Rivets inspection - checked
- Drive control - connected, fixed

5. Right wing – rear part

- Leading edge entirety, deformations - checked
- Surface state - checked

Right aileron and flap

- No deformation – checked
- No cracks on the rivet fastening spot - checked
- Drive control axis - fixed
- Up and down movement - free and fluent
- Drive control axis - fixed

6. Main undercarriage – right leg

Undercarriage leg

- No cracks, no surface breaks - checked
- Wheel axles - right placed and secured
- General state, no deformations - checked

Wheel

- Rim - checked
- Pumped up tire, no damages - checked
- Creep marks on the rim - checked
- Distance between tire and wheel cover - sufficient
- Rotation axis - checked
- Brakes axis, free run, no damage - checked
- Brakes cable, fixed, no torsion - checked
- Brake system tubing - checked

7. Tail unit

Tail fin

- Leading edge no deformation, no damage - checked

Rudder

- General state, no deformation - checked
- Rivets no cracks - checked
- Feathering hinge, clearance, corrosion, securing - checked
- Rudder free movement , after the tail part is pushed - checked
- Down and nose wheel is up - checked
- Fixing or rudder cables - checked
- Control placing, corrosion, securing - checked

Elevator

- Leading edge no damages - checked
- Skin and rivets state - checked
- Two screws of elevator fixing - fixed and secured

- Elevator hinge clearance, corrosion - checked
- Elevator movement - checked
- Control no corrosion - checked
- Trim tab placing and hinge - checked

8. Main undercarriage – left leg

- Identical as by no. 6

9. Left wing – rear part

- Identical as by no. 5

10. Left wing – front part

- Identical as by no.4

Pitot tube

- Pitot tube covering – removed and stored
- Hose for static and dynamic pressure - connected
- Inlet for stall speed indication - checked
- Static inlets -checked

11. In cabin

Instrument panel

- Fuse - checked
- Instruments state, altimeter adjustment - checked
- Ignition key - green checking light on
- Fuel gauge - indicates fuel state

Control stick

- Movement - free and fluent
- Operating rods seating - checked

Pedal-operated

- No deformation - checked
- Nose leg, rudder & pedals adjustment - checked

Control - throttle, choke, brakes, trimmer

- Movements - free and fluent
- Bowden cables - checked

Center-section

- No deformation, welded points without damage

-checked

Safety belt

- General state - checked
- Fixing to fuselage - checked

Doors

- General state, clean, no scratches - checked
- Fixing to the centre-section - checked
- Door closing system - functional

Baggage compartment

- Flaps drive cover - checked
- Baggage - checked

Emergency system

- Readiness of the system - checked
- Securing against unplanned deployment - checked

General inspection of the fuselage shell, damage, cracks, etc.

BEFORE START

PREFLIGHT - COMPLETED
SEATBELTS - FASTENED
DOORS - CLOSED AND LATCHED
PARK BRAKE - ON
FUEL VALVE - ON
MASTER SWITCH - ON -
(POSITION 1)
ENG MONITOR - ON
FUEL QUANTITY - CHECK
BATTERY BOOSTER LIGHT - ON
CHOKE - AS REQUIRED
FUEL PUMP - ON
FUEL PRESSURE - CHECK -
MIN. 0.15 BAR
STROBES - ON
IGNITION SWITCHES - ON
THROTTLE - IDLE
PROP AREA - "CLEAR PROP"
STARTER ENGAGE
RPM - 2000 - 2500 RPM for
WARMUP
OIL PRESSURE - CHECK
MIN - (12 PSI below 3500)
(29-73 PSI above 3500)
FUEL PUMP - OFF
(MIN. FUEL PRESS. 0.15 BAR)

EFIS, FLAPS, COM 1, TXPNDR,
GPS, INTERCOM, STROBE - TURN
ON OTHER LIGHTS - AS
REQUIRED

BEFORE TAKEOFF

SEAT BELTS - FASTENED
FUEL VALVE - ON
FUEL QUANTITY - CHECK
FUEL PUMP - ON - (PRESSURE
0.15 - 0.4 BAR)
CHOKE - CLOSED
MAG CHECK - 3500 RPM
MAX DROP 200 - 300 RPM
FLIGHT CONTROLS - FREE and
CORRECT
FLAPS - POSITION 1 -
CHECK VISUALLY
TRIM - SET - TAKEOFF POSITION
- GREEN
ALTIMETER - SET
TRANSPONDER - ALT - 1200 or
CODE
COM 1 - FREQUENCIES - SET
GPS - PROGRAMMED - SET
DOORS - CLOSED AND LATCHED

ENGINE INSTRUMENTS - CHECK

OIL TEMP -
MIN - TAKEOFF - 120 F/50C
MAX - 285 F
FUEL PRESSURE -
(0.15 - 0.4 BAR)
OIL PRESSURE -
(12 PSI MIN below 3500)
(29 - 73 PSI above 3500)
CHT - MAX - 300 degrees F

BEFORE LANDING

FUEL VALVE - ON
FUEL QUANTITY - CHECK
FUEL PUMP - ON
FUEL PRESSURE - CHECK
LIGHTS - AS REQUIRED
FLAPS - 70 MPH MAX
APPROACH - 60 - 65 MPH

PARKING CHECK

THROTTLE - IDLE
GPS - OFF
SWITCHES - OFF -
FUEL PUMP, FLAPS, COM 1,
TXPNDR, GPS, INTERCOM,
LIGHTS,
MAGS SWITCHES - OFF
MASTER SWITCH - OFF

4 Normal Procedures

4.2 Engine starting

Before you first start the engine (warm start)

- Secure the aircraft so that it could not move spontaneously (by means of locking brake)
- Make sure there is nobody standing in the vicinity of the propeller
- Turn the fuel cock on
- Pump the fuel into the carburettor by electric fuel pump
- Switch the magnetos on
- Start up the engine by turning the key into the position 2
- Let the engine warm up according to the engine producer manual

4.3 Taxiing

- Taxi slowly (at walking speed) and adjust the speed to the condition of the terrain
- When taxiing, keep the control stick fully pulled backwards (so that the load upon the nose undercarriage is minimized)
- Under crosswind conditions move the control stick into wind to deflect the ailerons in such a way that the aircraft is sufficiently banked against the wind.

4.4 Normal takeoff

- Opening the throttle makes the aircraft move; when you reach the take-off speed, pull the control stick slightly backwards to get the aircraft off the ground
- After you take off, keep on flying level close above the runway for a while until you reach the climbing speed and then maintain that speed until you get into safe altitude in case the engine failed
- Set the flap control lever to the cruise position (0) after reaching 100 feet

4.5 Best angle of climb speed (V_x) 70 mph

4.6 Best rate of climb speed (V_y) 75 mph

4.7 Cruise (training) 90 mph

Recommended cruising RPM 4800 to 5000 RPM

Airspeed 90 - 100 mph

AIS gauge in green arc

Trim airplane using rudder and manual trim lever above the PIC head

4 Normal Procedures

4.8 Approach - 70 mph (depending on crosswind situation)

Let down from cruise altitude to pattern altitude 4000 RPM

Airspeed 90 KIAS

Downwind airspeed 80 mph

Base leg 75, 3800 RPM, flaps at 15° position 1

Final approach - 65 mph 2800 RPM, flaps at 15°, position 1

Upon landing assurance: 55 mph, 2600 RPM, flaps 15°, position 1

NOTE: increase airspeed by 1/2 the gust factor to compensate for wind sheer

4.9 Normal landing

Upon landing assurance, at approximately 1 to 2 feet off ground, close throttle, touchdown speed 50 mph/

- 200 feet above the earth set the flaps to the landing position
- Bring the aircraft to approximately 2 feet above the earth and with the throttle lever set to minimum pull the control stick slightly backwards to make the aircraft slow
- The aircraft lands at the speed of about 40 to 42 mph
- Before turning the engine off let it cool down to the recommended temperature according to the engine manual and switch off all electrical

4.10 Short field takeoff and landing procedures

TAKEOFF: Hold brake while applying high power, then release brake for short field take-off

LANDING: On base, set flaps for 48°, position 2. Final airspeed is 55 mph, upon touchdown apply brakes firmly.

4.11 Soft field takeoff and landing procedures

TAKEOFF: Set flaps to -4.0° (position 0) Get engine speed up, hold back pressure on the stick to reduce pressure on nosewheel. Stay in ground effect while building up speed.

LANDING : Set flaps to 48° *position 2) Touchdown speed should be about 5 mph more than normal, keep back pressure on the stick to keep nose wheel up, landing on mains and the releasing the stick to let the nosewheel down.

4 Normal Procedures

4.12 Balked landing procedures

If full flaps engaged;

- Push throttle to maximum power
- After reaching 70 mph - switch Flaps to position 1
- Start climbing at 70 mph
- Set Flap control to cruise position (0) after reaching 100 feet altitude
- Continue normal flight

If 15° Position 1 flaps engaged

Push throttle to maximum power

Start climbing at 70 mph

- Set Flap control to cruise position (0) after reaching 100 feet altitude
- Continue normal flight

4.13 Any other useful pilot information

When all else fails----AFTA = Always Fly The Plane

Flying in turbulence

- In a strong turbulence preferably maintain the speed of about 63 to 74 mph
- When making a turn do not bank more than 20°.

Flying in the rain

- It is not recommended to take off in the rain!
- If you get into rain during the flight, maintain the speed above 74 mph
- If you must land during the rain, approach at higher speed 74 mph

It is allowed to fly the aircraft only VFR conditions(the ground is visible) . VFR and when no danger of icing exists.

Stalls, Sping and other Useful Information

Stalls: For stall speeds refer to the operation limitation sections

Stalling of the Allegro® is normal and conventional. Recovery is quick and a minimum altitude is lost. Just prior to the stall, the elevator becomes light in feeling. Rudder coordination is important to ensure that the stall does not become uncoordinated and turn into a spin.

It is recommended to not fly at speeds less than 50 mph at an altitude less than 1000 AGL unless in a landing configuration.

Spins: The Allegro ® is not approved for spins or any type of acrobatic maneuvers.

5 Performance

5.1 Takeoff total distance over a fixed-height (50 ft) obstacle using normal take off procedures as defined in 4.4

820 ft. with Rotax 912 (80 hp)
750 ft. with Rotax 912S (100 hp)

5.2 Landing total distance over a fixed-height obstacle using normal landing procedures as defined in 4/9

721 ft.

5.3 Rate of climb

1000 Ft/Min with Rotax 912 (80 hp)
1200 Ft/Min with Rotax 912S (100 hp)

5.4 Cruise speeds

Rotax 912 (80 hp)	120 mph @ 5000 RPM
Rotax 912S (100 hp)	122 mph @ 5000 RPM

5.5 RPM setting and fuel consumption

Rotax 912 (80 hp)
Fuel consumption @ 5800 RPM 6.1 gph
Fuel consumption @ 5500 RPM 4.6 gph
Fuel consumption @ 5000 RPM 4.0 gph

Rotax 912S (100 hp)
Fuel consumption @ 5800 RPM 7.1 gph
Fuel consumption @ 5500 RPM 5.6 gph
Fuel consumption @ 5000 RPM 5.0 gph

6 Weight and Balance and Equipment List

6.1 Weight and Balance Chart

Minimum Front-Seat Pilot Weight	120 Lbs
	(ballast may be added to meet weight)
Maximum Weight of the Crew and Fuel	673 Lbs
Baggage Weight	22 Lbs
Maximum Take-off Weight	1320 Lbs
Empty Weight	647 Lbs

Allowable Distances of the Centre of Gravity from the Wing Leading Edge

+ Maximum CG front position	11 inches = 25 %
+ Maximum CG back position	15.4 inches = 35 %

How to Determine the Aircraft's Centre of Gravity Position

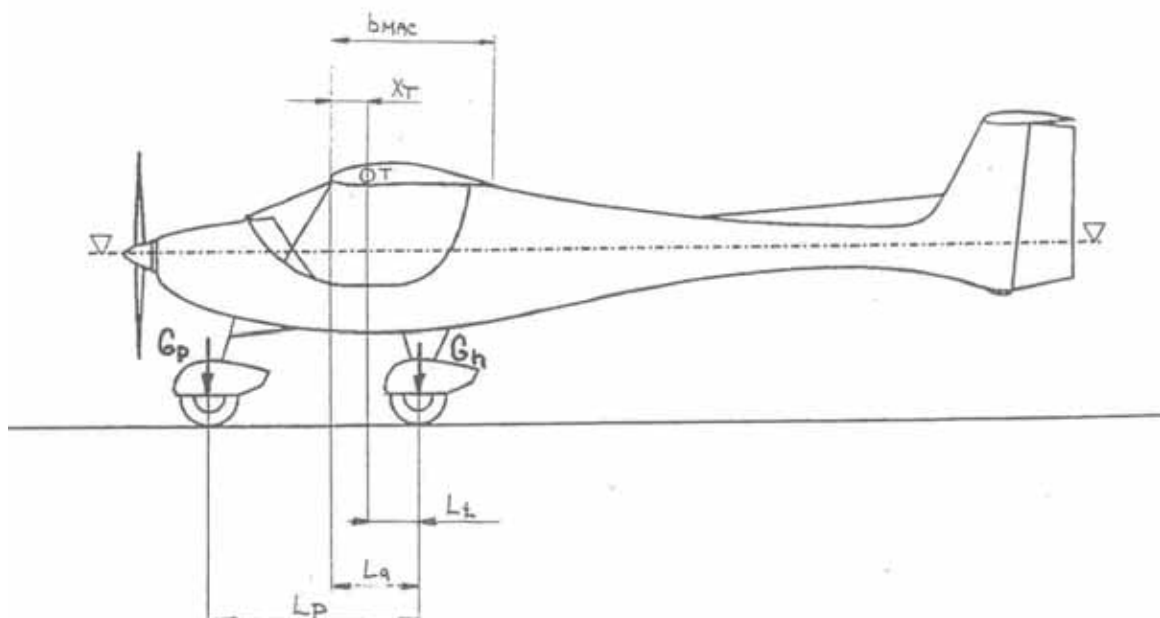
Place the aircraft with its wheels onto three scales. The aircraft must be in the cruise position, i.e. with its fuselage axis levelled horizontally.

Determine the total weight of the aircraft (G) as a sum of the weight readouts from the scales located under the main wheels (G_h), (which is the total of the weight readouts from the scales located under the left and right main wheels) and the weight readout from the scales located under the nose wheel (G_p).

Measure the distance between the main undercarriage axis and the nose wheel axis (L_p).

Measure the distance from the wing leading edge (using a plumb bob) to the main undercarriage axis (L_a).

Measurements chart:



6 Weight and Balance and Equipment List

6.1 Weight and Balance Chart(cont)

Calculation for determining the aircraft's center of gravity position

bMAC = 44 inches

XMAC = 0.55 inch

$L_t = \frac{G_p \times L_p}{G} =$ the distance of the aircraft centre of gravity from the main undercarriage axis G (in.)

Xt = La - Lt - XMAC

This distance expressed as the percentage of the mean aerodynamic chord (MAC) is

X% = 100 x Xt /bMAC

Determined values

G =..... / *.....Lbs

Xt =..... / *..... inches

bMAC =..... 44 inches

La =.....inches

Gp =..... / *.....Lbs

Lp =.....inches

Gh =...../ *.....Lbs

Lt =...../*.....inches

X% =...../*.....%

* Wtih one pilotLbs

The position of the aircraft's centre of gravity has to be from 25 % to 35 % of SAT.

Note: The position of the center of gravity of an empty aircraft almost exactly equals to that of an aircraft in the cruise position with one or two pilots and with the fuel tank empty or full.

6 Weight and Balance and Equipment List

6.2 Operating weights and loading (occupants, baggage, fuel, ballast)

Minimum Front-Seat Pilot Weight	121 Lbs	(ballast may be added to meet weight)
Maximum Weight of the Crew and Fuel	673 Lbs	
Baggage Weight	22 Lbs	
Maximum Take-off Weight	1320 Lbs	
Empty Weight	647 Lbs	

6.3 Center of gravity (CG) range and determination

Allowable Distances of the Centre of Gravity from the Wing Leading Edge

- + Maximum CG front position 11 inches = 25 %
- + Maximum CG back position 15.4 inches = 35 %

How to Determine the Aircraft's Centre of Gravity Position

Place the aircraft with its wheels onto three scales. The aircraft must be in the cruise position, i.e. with its fuselage axis levelled horizontally.

Determine the total weight of the aircraft (G) as a sum of the weight readouts from the scales located under the main wheels (Gh), (which is the total of the weight readouts from the scales located under the left and right main wheels) and the weight readout from the scales located under the nose wheel (Gp).

Measure the distance between the main undercarriage axis and the nose wheel axis (Lp).

Measure the distance from the wing leading edge (using a plumb bob) to the main undercarriage axis (La).

7.4 Equipment List :

Standard Equipment: Radio/Intercom, Cabin Heat, Wheel Pants, Nav Lights, Wing strobe lights Tail Strobe Light, Landing Light, Halogen wingtip Lights, Window Vents, EMS, Stall speed indicator Locking Cabin, Hour Meter, Rotax 912 (80 hp), Hydraulic disc brakes, Electrical Flap Control, Carpet & Upholstery in Cockpit, Composite Three Blade WoodComp Propeller, Choice - Color Design, ELT (Emergency Locator Transmitter), Electric Fuel Pump, Quick Release Drain Valve

ENGINE GAUGES: RPM Tachometer, CHT, Oil Temperature, Oil Pressure, EGT's

Fuel Pressure	Compass
Airspeed Indicator	Fuel Level
Altimeter Indicator	Flap Indicator
Variometer	Bank Indicator

**Allegro 2007 Special Light-Sport Aircraft
N90652
S/N 07-236**

SAMPLE

Weight & Balance Limitations and Work Sheet

Important Aircraft Limitations	<u>English</u>	<u>Metric</u>
Minimum Front-Seat Pilot Weight	121 Lbs	55 Kg
Maximum Weight of Pilot, Crew and Fuel *	673 Lbs	306 Kg
Maximum Baggage Weight	22 Lbs	10 Kg
Maximum Take-off Weight (Per aircraft data plate)	1320 Lbs	600 Kg
Aircraft Empty Weight (Per aircraft data plate)	647 Lbs	293 Kg
* Adjusted so that max. gross weight limitation of aircraft is not exceeded		
> Max CG Arm - Forward */**	10.95 in	278 mm
> Max CG Arm - Aft */**	15.35 in	390 mm
* CG dimensions are aft of datum		
** Datum point is leading edge of wing		

Weight & Balance Calculations			
	<u>Weight (lbs)</u>	<u>Arm (inches)</u>	<u>Moment</u>
Aircraft Empty	647	10.31	6670.57
Front Seat Pilot/Pax		18.35	
Fuel 14.5-gal or 87-lb max		15.00	
Baggage		32.00	
Totals			

**Example: Full Fuel; 22-pounds baggage; 476-pounds Pilot and Passenger
(Maximum Gross Weight Configuration)**

	<u>Weight (lbs)</u>	<u>Arm (inches)</u>	<u>Moment</u>
Aircraft Empty	647	10.31	6670.57
Front Seat Pilot/Pax	549	18.35	10074.15
Fuel 17-gal or 102-lb max	102	15.00	1530
Baggage	22	32.00	704
Totals	1320	14.38	18978.72

Weight = 1320 lbs (maximum gross weight; okay)
CG = 14.38 inches (between 10.95" <> 15.35" Okay)

Example: Single Pilot; minimum 1-gallon of fuel; no baggage

	<u>Weight (lbs)</u>	<u>Arm (inches)</u>	<u>Moment</u>
Aircraft Empty	647	10.31	6670.57
Front Seat Pilot/Pax	121	18.35	2220.35 *
Fuel 17-gal or 102-lb max	6	15.00	90
Baggage	0	32.00	0
Totals	774	11.60	8980.92

Weight = 774-pounds (under 1320-pounds, the maximum gross weight; Okay)
CG= 11.60 inches (between 10.95" <> 15.35" Okay)

* Using minimum front seat pilot weight limitation (see POH) of 121-pounds or 55-Kg

6 Weight and Balance and Equipment List

6.4 Installed optional equipment list affecting weight and balance

All added equipment, if installed after the manufacturing, would need to be added to the empty weight and refigured. All added equipment would be on the CG.

-----Extensive Electronic avionics (optional) 2-5 lbs additional to instrument panel

-----Ballistic recovery systems (optional) 34 lbs placed behind co-pilot seat

-----Floats (optional) would need to be approved by the manufacturer.

-----Amphib Floats (optional) would need to be approved by the manufacturer.

7 Description of Airplane and Systems

7.1 General Information

The cabin is equipped with two seats side by side and will be exited by the doors on the left and right side of the fuselage.

Design: Main components are build in halfshells, from composite fiber material, which are bonded together (carbon fiber, Kevlar® and fiber glass)

Airframe Dimensions

Wing Span	35.5 ft.
Airframe Length	21 ft.
Total Height	6.7 ft.
Wing Area	122.4 sq. ft.
Aspect Ratio	9.5
Wing Chord-max	47.24 inches
Wing Chord-min	25.78 inches
Airfoil Section	SM 701

Aileron and rudder deflection

Aileron	Up	6.49 inches	+ - 0.2 inch
	Down	2.16 inches	+ - 0.2 inch
Elevator	Up	3.11 inches	+ - 0.2 inch
	Down	2.59 inches	+ - 0.2 inch
Rudder	Right	5.27 inches	+ - 0.2 inch
	Left	5.27 inches	+ - 0.2 inch

Other Data

Undercarriage	tricycle front landing gear
Main Wheel Track	61 inches
Tire Dimensions	
Main wheels	14 x 4 (350 x 100)
Nose wheel	14 x 4 (350 x 100)
Tire Pressure	0.10 -0,12 Mpa (15 psi – 17 psi) nose wheel 0.18 Mpa (26 psi) main wheels
Suspension	by flexibility in the laminated undercarriage leg
Wheel brakes	hydraulic brakes
Engines	Rotax 912: 80 hp Rotax 912S: 100 hp

7 Description of Airplane and Systems

7.2 Technical Description

The Allegro 2007 aircraft is an aerodynamically controlled, two-seat, side by side high-wing LSA aircraft with the engine at the front and a T-shaped tail, tricycle landing gear, hydraulic main wheel brakes, steerable nose wheel, landing gear suspension using the flexibility of the tires and rubber pads for suspension.

The aircraft is constructed of aluminium, steel and composite laminates; the fuselage is welded from metal tubes and is enclosed in composite.

The wing is divided in the middle into two halves, both of which are mounted to the fuselage by bolts and supported by wing struts. The wing is designed as a rectangle with trapezoidal outer end. The load-bearing part of the wing is represented by a torsion box consisting of an aluminium spar and a skin made of aluminium sheet. The spar flanges are made of aluminium L-sections, the spar web is made of aluminium sheet.

The airfoil profile of the wing is maintained by ribs made of aluminium sheet.

The ailerons and flaps are separate.

The tail is T-shaped; its construction is similar to the wing.

The fuselage is all-laminate, stiffened by several internal ribs. The engine mount and the nose wheel leg are attached to the front "engine" bulkhead made of laminate sandwich. The central "pilot" bulkhead serves for attaching adjustable seats and at the rear end of the fuselage there are two ribs made of laminate sandwich to stiffen the tail fin.

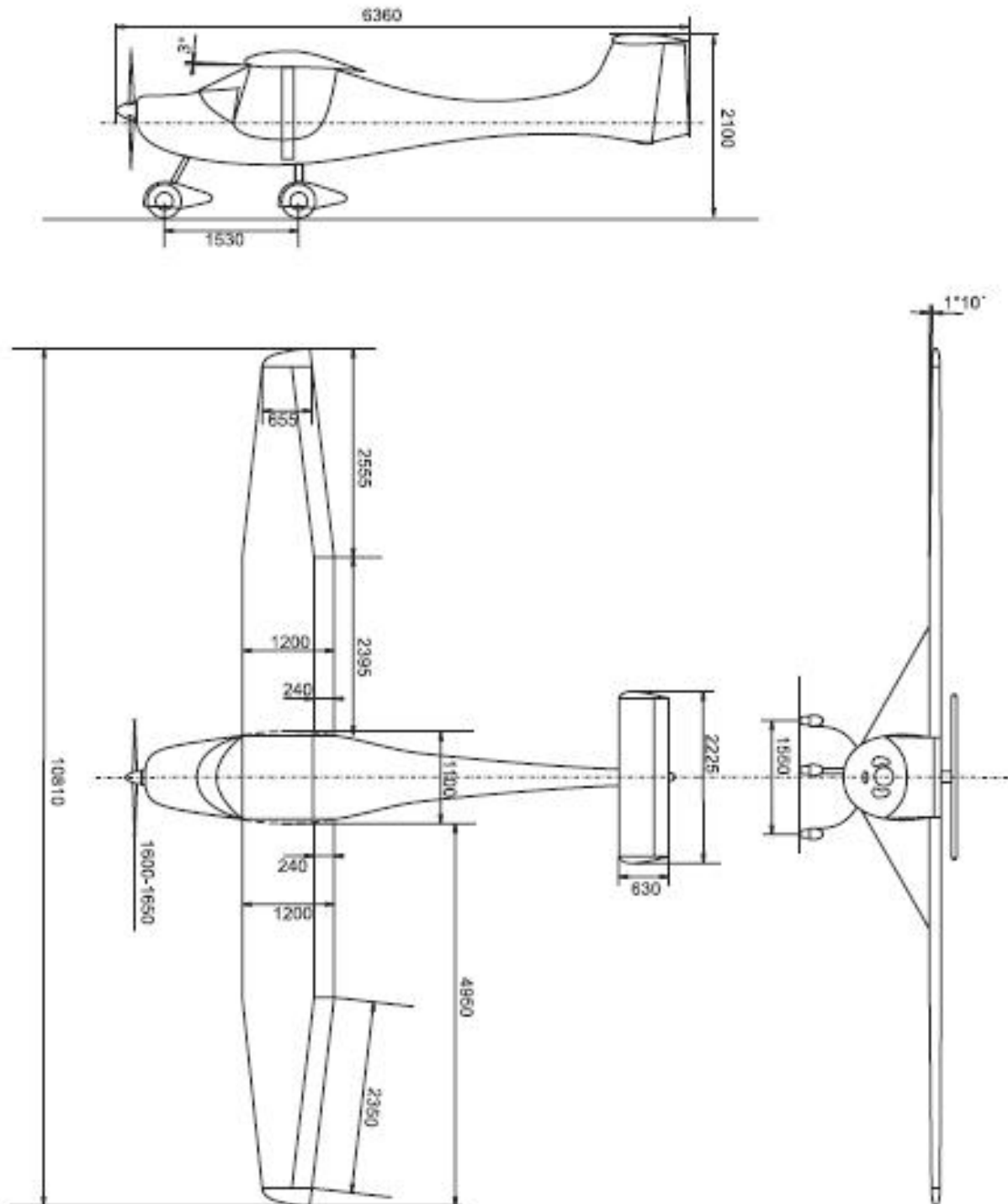
The fuselage structure is welded together from metal tubes; the cockpit is covered by a transparent windshield made of polycarbonate splinter-proof material. (Beware of fuel staining which damages this material!!!) Below the seats there is a fuel tank made of laminate whose inner surface is covered by a conductive layer of graphite, fuelling is made from the left side of the aircraft.

The landing gear is tricycle type. The main wheels are equipped with hydraulic disk brakes controlled by a mechanical brake lever located on the control stick. The nose wheel is steerable; it is connected to the foot control system. The nose wheel has rubber suspension.

The aircraft has single joystick control; the control stick is situated in the middle of the aircraft between the two seats. The foot control system consists of two sets of pedals (one set for each of the pilots). The flaps are actuated by means of an electric switch located on the panel between the two pilots.

7 Description of Airplane and Systems

7.2 Airframe



7 Description of Airplane and Systems

7.3 Flight Controls

FOOT CONTROL

– when the left pedal is depressed the aircraft turns to the left, both on land and in the air, and vice versa.

Hand Control

(located in the middle of the cockpit) – when the control stick is pulled backwards, the nose of the aircraft raises upwards (the angle of incidence increases); when the control stick is pushed forward, the nose of the aircraft goes down. When the stick is deflected to the left, the aircraft banks to the left and vice versa.

Throttle Levers

– are located on the outer side of each seat. When the lever is pushed forward, the more the engine speed increases. There is a screw for adjusting the mechanical rigidity of the lever's movement, located in the middle of the operating rod (under the central cover of the control panel).

Engine Ignition Switches

– are located on the control panel in the middle of the cockpit. The ignition is enabled when the switches are set to the down position.

Main Wheel Brakes

– are controlled by means of a hand operated lever located on the control stick. The lever is also equipped with a control for the parking brake.

7 Description of Airplane and Systems

7.4 Instrument Panel (Standard)



- | | | | |
|----|--------------------------|-----|--------------------------------|
| 1. | Airspeed indicator | 10. | EMS (engine monitoring system) |
| 2. | Altimeter | 11. | Charging indicator |
| 3. | Slip/skid indicator | 12. | Master Switch |
| 4. | Vertical speed indicator | 13. | Dual magneto switches |
| 5. | Fuel quantity gauge | 14. | Circuit breakers |
| 6. | Cabin heat | 15. | Dual throttles |
| 7. | Fuel pressure gauge | 16. | Elevator trim tab lever |
| 8. | Hobbs meter | 17. | Electric flap indicator |
| 9. | ICOM 210 radio/intercom | 18. | 12 volt power port |

To comply with the rules of Light Sport Aircraft airworthiness, the listed minimum instrumentation and equipment is provided as standard equipment.

To comply with the rules of Light Sport Aircraft airworthiness, the listed minimum instrumentation and equipment is provided as standard equipment.

Standard Equipment: Radio/Intercom, Cabin Heat, Wheel Pants, Nav Lights, Wing strobe lights Tail Strobe Light, Landing Light, Halogen wingtip Lights, Window Vents, EMS, Stall speed indicator Locking Cabin, Hour Meter, Rotax 912 (80 hp), Hydraulic disc brakes, Electrical Flap Control, Carpet & Upholstery in Cockpit, Composite Three Blade WoodComp Propeller, Choice - Color Design, ELT (Emergency Locator Transmitter), Electric Fuel Pump, Quick Release Drain Valve

ENGINE GAUGES: RPM Tachometer, CHT, Oil Temperature, Oil Pressure, EGT's

Fuel Pressure

Airspeed Indicator

Altimeter Indicator

Variometer

Compass

Fuel Level

Flap Indicator

Bank Indicator

7 Instrument Panel

7.5 Flight Instruments

ASI - Air Speed Indicator

TOTAL WEIGHT OF THE AIRCRAFT (lbs)

Take-off

Climbing Speed

Landing Approach Speed

Maximum Rate of Climb with Rotax 912 80hp



Altitude Indicator



VSI Variometer



Standard Engine Monitoring System (EMS)

- Engine speed RPM - Tachometer
- Operating Hour Meter
- Exhaust Temperature Gauge (EGT)
- Water Temperature (CHT)
- Oil Temperature Gauge
- Oil Pressure Gauge



7 Airplane and Systems Descriptions

7.6 Engine Rotax 912 UL (80hp)

Power Plant 80 HP Rotax 912 option with electric starter, stainless steel exhauster with integral heating, airbox, and 3-blade on the ground adjustable Woodcomp Klassic 160 propeller and spinner are STANDARD.
Optional Rotax 912 S 100 ph engine.

DESCRIPTION:

4-cylinders
4-stroke
liquid/air cooled engine
with opposed cylinders
dry sump forced
lubrication with separate
3 l (0.8 gal US) oil tank
automatic adjustment by
hydraulic valve tappet
2 CD carburetors
mechanical diaphragm
pump
electronic dual ignition
electric starter
integrated reduction gear
 $i = 2,273$
(option $i=2,43$)

WARNING:

This aircraft engine does not comply with federal safety regulations for standard aircraft. This engine is for use in experimental and ultralight, light sport, and uncertified aircraft only and only in circumstances in which an engine failure will not compromise safety.

Technical Data:

Performance for standard conditions (ISA)

ENGINE Type: 912 ULS D.C.D.I.

912 S D.C.D.I.

Performance 69,0 kW (95,0 hp) @ 5500 1/min(rpm)

Max. 5 min.: 73,5* kW (100,0* hp) @ 5800 /min(rpm)

* with ROTAX Airbox and custom exhaust system
torque 128 Nm (94,0 ft.lbf.) @ 5100 1/min (rpm)

Max. RPM: 5800 1/min (rpm)

Bore: 84,0 mm (3,31 in.)
stroke: 61 mm (2,40 in.) displacement: 1352,0 cm³
(82,6 cu.in.)
compression ratio: 10,5:1
ignition unit: DUCATI double CDI
ignition timing: 4° up to 1000 1/min (rpm)/ above 26°

spark plugs: ROTAX part no. 297 940
generator performance: 250 W DC @ 5500 1/min
voltage: 13,5 V

OPERATING MEDIA:

Fuel: min. RON 95* - min. AKI 91*

*premium unleaded or AVGAS 100 LL

Oil: API SF or SG

cooling liquid: 50% BASF Glysantin-Antikorrosion

/ 50% water

WEIGHT-engine:

Standard - engine with gearbox $i=2,43$: **56,6 kg (124,8 lb.)**

WEIGHT-Options :

oil radiator 886 029: 0,5 kg (1,1 lb.)

radiator 995 697: 1,0 kg (2,2 lb.)

slipping clutch: 1,0 kg (2,2 lb.)

Airbox: 1,3 kg (2,8 lb.)

air cleaner 825 711: 0,15 kg (0,3 lb.)

exhaust: 4,0 kg (8,8 lb.)

air guide hood: 0,8 kg (1,8 lb.)

rectifier regulator: 0,1 kg (0,2 lb.)

fuel pump with installed fuel lines covered with fire resistant tubine: 0,2 kg (0,4 lb.)



7 Description of Airplane and Systems

7.7 Propeller

ON GROUND ADJUSTABLE PROPELLER

TYPE KLASSIC 150, 160 , 170



PROPELLER DIAMETER : Klassic 150cm , Klassic 160cm , Klassic 170cm

APPLICATION : ROTAX, SUBARU, BMW, VERNER, HKS, NISSAN etc.

The propeller blades are manufactured with a composite shell, formed from a special, new generation fabric. This design creates an excellent sandwich construction. The rotational and centrifugal forces are transferred to the propeller hub by means of the significant structural element, i. e. composite shaped tube, which is inserted into shank, blade root and so into the blade body itself.

Fixing the blades into hub is carried out by rigidly clamping the propeller blades, which does not allow their turning or vibrating.

The hub of the ground adjustable propeller is designed with heavy emphasis on safety and complies with all operational safety regulations.

WOODCOMP Klassic and Winglet propellers have passed a highly demanding test regime, which has demonstrated their high level of safety in operation.

Limiting operational parameters:

WOODCOMP Klassic propellers have been designed for operation on engines with reduction gearboxes, of power output up to 100 HP.

Using the propeller with engines which are not equipped with elastic fixation it is not permitted for safety reasons.

Spinners:

Composite twin blade, three blade and four blade propellers can be equipped with composite spinners of diameter 235mm



8 Handling and Servicing

8.1 Introduction

Due to the low weight of the Allegro®, it is very easy to move the aircraft on the ground by hand. That's why there is no special equipment for towing provided. In no case, shall the aircraft be towed with any type of tow motor. (Manufacturer allows for pulling or pushing at the base of the propeller and pivoting before the tail for turning the position of the plane.)

CAUTION

NEVER TOW WITH A TOW MOTOR

8.2 Ground Handling - Towing

- 1- One person is required to tow and tie down the aircraft
- 2- To pull the aircraft, place both hands on the propeller hub and gently pull the aircraft
- 3- To push the aircraft from the tail, stand beside the fuselage in front of the tail pressing down on the fuselage to pick up the nose wheel. Push the aircraft to the desired location.

100/200 hr Service / 12 month inspection

Inspections are required for every hundred hours for planes used in flight schools and those light sport planes that fly more than 105 hours during the year. Annual Inspections are required for pilots who fly less than 95 hours during the year. Every 24 months, inspection the transponder (if installed) will need to be calibrated and certified by an authorized Avionics specialist. The detailed inspections for the Allegro® are located in the Allegro® Maintenance Manual. Inspections and the servicing that go along with inspections should be done by an authorized person only.

Airframe servicing

The body design of the Allegro® consists of a composite fuselage and aircraft aluminum wings, tail and rudder, which ensures extreme strength and a long lifetime of the whole aircraft. Maintenance is reduced to checks of the moving parts such as locks, hinges, and connections. Prior to each flight a visual check of the whole aircraft (see aircraft inspection) for cracks, dents, or other damages should be conducted. Damage to the airframe (composite bodywork) must be repaired by a skilled and authorized person only

Main gear servicing

The main gear is made from composite with no metal reinforcements. As with the fuselage, the main gear requires no regular servicing. The hydraulic hoses of the brake system are located on the inner surface of the gear legs for ease of inspection. A visual check for cracks or splitting and tire condition has to be carried out prior to each flight. The manufacturer recommends replacement rather than repair of the composite main gear. Air pressure within the main tires should be maintained at 26 psi.

8 Handling and Servicing

Nose gear servicing

The nose gear is a rubber shock mounted steel tube afixed to the fuselage inside the engine compartment.

Nose wheel should be inflated to 15-17 psi. The nose gear needs no special servicing between regular service intervals. A visual check of the tire condition has to be carrier out prior to each flight. Repair work to the nose gear must only be conducted by an authorized person.

8.4 Tie-down Instructions

If the aircraft is to be parked in an open area it is necessary to anchor it using ropes and anchoring stakes. In order to avoid any unplanned movement turn the aircraft with its nose against the wind, fix the tie down ropes to the catches on the wing ends and to the nose wheel, and if necessary also to the rear end of the fuselage. Tie the control stick (towards the seats) to lock the rudder and ailerons from moving in gusty winds. Cover the cockpit with a canopy cover to avoid any damage of the windscreen.

Place wheel chocks around the wheels to stop the aircraft rolling.

There are 3 tie down point on the aircraft. One under each wing and the skidbar on the tail.

Gust locking

Using a bungy cord , lock the stick in a forward position.

Hook the bungy cord around the stick and pull forward attaching the hooks to the outside rudder pedals.

All attachment must be made in such a way that the aircraft will not become damaged.

If anchoring the aircraft in a rainy weather or in conditions where water could condense in the airframe, it's necessary before the next flight to follow the steps as described in the section "Aircraft Washing".

8.5 Servicing fuel, oil, coolant, and other operating fluids as applicable.

One person is required to service the fuel, oil and coolant

FUEL

There is one fuel outlet in the Allegor 2000 and 2007 on the underside of the belly tank.

Place 6 gallon tank under the outlet to catch released fuel

Use 1/2 inch wrench to unscrew the outlet

If over 6 gallons, be sure to have additional 6 gallon tanks to catch all fuel.

(If wings tanks are installed, be sure to have both right and left release valves are open. They will gravity feed into the belly tank.

8 Handling and Servicing

OIL

Remove the cowl and set in safe place
Remove the cap on the oil reservoir (put in safe place)
Manually turn propeller the normal direction of rotation
until you hear the gurgle of oil being released from the engine
Remove dipstick and wipe off with clean rag
Replace dipstick, then remove and read the oil level on the flat part of the stick
Replace dipstick
Replace reservoir cap

COOLANT

Make sure engine is cool
Check overflow bottle for coolant
Replace cowl over engine

Coolant is added during the year as needed and changed out every 2 years at the annual inspection and service.

Refuelling

To be made only after the engine and all aircraft electric equipment has been switched off. It is strictly prohibited to smoke and to have an uncovered flame within 20 yards vicinity of the aircraft whilst refuelling.

Fill the aircraft fuel tank using a filtering funnel or a gastculator attached to a fuel tank to check the fuel purity as well as the purity of the storage vessels. Avoid the use of poor quality fuel or old stale fuel, buy the fuel at fuel stations with new storage tanks and use new drums for transporting the fuel to the airport facility.

8.6 Approve fuel grades and specifications

Allegro® 2000 Fuel capacity 14.5 gallons capacity with 14 gallons usable
Allegro® 2007 Fuel capacity 17 Gallons capacity with 16.5 gallons usable

Allegro ® 2000 & 2007 with Rotax 912 - 80 hp

Gasoline 87 Octane
100 Low Lead AvGas

Allegro @2000 and 2007 with Rotax 912S -

Gasoline 93 Octane
100 Low Lead Avgas

8 Handling and Servicing

8.7 Approved Oil grades and specifications

For a complete description refer to the Rotax owner's manual supplied with the aircraft. General heavy duty 4 stroke only motorcycle oils that incorporate gear oil additives are acceptable. Brands like Yamaha, Honda or Amsoil motorcycle oils are acceptable.

Use only oil that meets API classification of 'SF' or 'SG'.

Semi-synthetic or fully synthetic are preferred.

Do not use oils that contain friction modifiers, reducers or mineral oils.

Do not use Diesel engine oils.

Engine Oil	Motorcycle Engine Oils, Synthetic or semi-synthetic .75 gallons (2.8 liters) During the break in period, first 50 hours, do not use synthetic or semi-synthetic (recommended oil for 25 hr oil change is Pennzoil 10W40)
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If you used 110 Low Lead Avgas (most of the time) follow Rotax manufacturer's recommendations.

Collant, recommended fluid:	BASF Glysantin, green
Collant capacity: (mixture of antifreeze/water 1:1)	.65 gallons (2.5 liters)

8 Handling and Servicing

8.8 Cleaning and care

- Openings of the static inlet, stall speed indicator and Pitot's tube must be covered before any aircraft washing.
- Wash the aircraft with standard car-shampoo and water. Avoid using any solvents or any cleaning agents which may influence aluminium or laminate.
- All insects stuck on the aircraft can substantially influence performance and handling characteristic of the aircraft. Remove them BEFORE they go hard.
- The best way to wash the aircraft is to soak the plane with plenty of clean water first. If there are lots of bugs wet a cloth and lay over the affected area and allow the soaking water to soften the bugs for easier removal. Avoid using brushes which could damage the aircraft surface.
- After drying the aircraft surface you should treat it with car polish, we recommend Nu-Finish which will make cleaning the aircraft much easier next time.
- The cockpit transparent windshield cleaning requires special care. You must not use any organic solvents or fuel which will cause permanent damage. Use lots of water for its cleaning. Never use the same water used for the aircraft cleaning, use freshwater. Use also a separate sponge and rag for drying of the windshield.
- After finishing the aircraft cleaning, check if there is no water in wings and tails.
- Remove the cowling and check if there is no water inside the engine compartment, dry it if necessary.
- Remove the covers from the static inlet, stall speed indicator and Pitot's tube, check there is any water.
- By lightly blowing into the Pitot tube the airspeed indicator pointer must move and return back onto the "0" position.

When operating the aircraft on grassy or muddy areas remove the wheel spats from time to time and clean them. Mud layers inside the wheel spat can cause additional weight and excessive stress and possible damage.

LIST CLEANING SUPPLIES TO USE AND THOSE NOT TO BE USED.

To Remove Bugs: Wet the wing leading edge, cowl, and tail leading edge, let stand then scrub away with clean rag (should be done daily)

Dawn Liquid (small amount) with water for cleaning surface of wings and fuselage

NEVER use Windex on doors or windshield --will cloud the macrolon

Never use Lemon Pledge on Windshield or door, will stain the fiberglass of cowl and fuselage

Windshield, doors, any macrolon service we recommend:

Clear View Cleaner - Aviation Laboratories - (may use soft clean rag)

Clear View Polish & Protectant - Aviation Laboratories (use very soft clean cloth)

You may use Windex to clean the underside of the fuselage of exhaust stains

9 Supplements

9.1. Additional information from the manufacturer

9 Supplements

9.2 Required placards and markings

Labelling

Additional to the warning above there must be another label, also well visible to the pilot with the following information

· Aircraft Serial Number	No.
· Empty Weight	647 Lbs
· Maximum Take-off Weight	1320 lbs
· Maximum Payload	673 lbs
· Maximum Load in the Baggage Compartment	22 Lbs
· Minimum Pilot Weight (OK to add ballast)	121 Lbs
· Never Exceed Speed (Vne)	138 MPH
· Stall Speed with fully extended flaps (Vs0)	45 MPH

Above the fuel tank cap there must be a label specifying the tank capacity and the required fuel quality.

Allegro® 2007

· 100 hp Rotax - Premium Unleaded	Quantity = 16.75 Gallons usable
· 80 hp Rotax - Normal Unleaded	Quantity = 16.75 Gallons usable

Allegro® 2000

100 hp Rotax - Premium Unleaded	Quantity = 13.5 gallons usable
80 hp Rotax - Normal Unleaded	Quantity - 13.6 gallons usable

9.3 Airspeed Indicator Range Markings

White Arc (flap operating range)	0 -80 MPH
Green Arc (Normal operating range)	50-100 MPH
Yellow Arc (Smooth air only range)	100-120 MPH
Red Line (never exceed)	138 MPH

9 Supplements

9.4 Operating Limitations on instrument panel

Maximum RPM	5800
Maximum EGT	1616°F
Maximum CHT	248°F
Maximum Oil Temp	266°F
Maximum Oil Pressure	95 PSI

9.5 Passenger Warning per manufacturer

In the pilot's cockpit there must be a label located on a well visible place with the following text

"This Aircraft is not subject to the certification by the Civil Aviation Authority of the Czech Republic and it is operated at the user's own risk. Aerobatics and deliberate spins are prohibited."

9.6 No Intentional Spins (see 9.5)

9.7 Miscellaneous placards and markings

Identification plates inside the cockpit (above co-pilot's seat) and identification plate on pilot side of empennage near rudder cables. to identify serial number of plane, make and manufacturer.

Tail trim for "Nose UP" and "Nose DOWN" at trim lever
Circuit breakers: above or below breaker switch

9.8 Operation of optional equipment or accessories

Manuals for accessories and additional equipment placed in owners envelope
Avionics manuals
Propeller manual
Rotax manual
Weight and balance
Limitations
Airworthy certificate
Statement of compliance

9.9 Supplementary Information

Flight Training Supplement

Introduction

This chapter should enable you to familiarize yourself with the flight performance and flight characteristics of the Allegro ®. To conduct these instructions you have to refer to the appropriate chapters provided by the POH.

The following page describe flight characteristics experienced during various flights, configurations and weather conditions:

- Takeoff
- Climbing
- Cruise
- Stall
- Slip
- Gliding
- Descent
- Approach
- Touch down

This chapter was introduced only as an additional guide to experience the capabilities of the aircraft, it is not a substitute to flight school training.

If you are not yet familiar with the aircraft, we strongly recommend the follow of these instruction only when accompanied by a skill flight instructor.

Cold Start:

Throttle off, choke full on, fuel pump on, mag switches off with key rotate engine 2-5 seconds (engine will not start as mags are off - this will prime engine)

Advance throttle 1/4 to 1/2 inch open, rotate choke to full closed, Turn mags to on position, turn key to start.

Let engine warm per specifications.

NOTE:If you cold start a warm engine it will flood the engine and/or backfire,

Warm Start

Advance throttle 1/4 to 1/2 inch open, rotate choke to full closed, Turn mags to on position, turn key to start.

Let engine warm per specifications.

9.9 Supplementary Information

Flight Training Supplement

Takeoff

Takeoff under normal conditions

1. After the preflight check has been carried out, extend flaps to #1(15°) position.
2. Ensure that the elevator trim is in correct position.
3. Whenever possible, takeoff directly into wind. The maximum crosswind limitation for takeoff is 18 mph (15 kts).
4. Smoothly apply full throttle (fully forward) and maintain runway heading
5. As the aircraft accelerates, gently pull back on the control stick to elevate the nose slightly until the aircraft becomes airborne.
6. Once airborne, slowly release the back pressure on the control stick to allow the air speed to increase to 70 mph (61 kts). Maintain this speed and avoid making any climbing turn until a sufficiently safe altitude has been reached.
7. When all obstacles have been cleared, retract the flaps to position 0 (-4.0°)

Takeoff at tailwind conditions - prohibited.

The takeoff run distance is affected by weather and surface conditions, as well as the takeoff weight of the aircraft. However, average distance is 350 to 500 ft.

Climbing

Climbing after takeoff

Once airborne, establish an indicated airspeed of 75 to 80 mph (65 to 70 kts). This airspeed will achieve the aircraft's best rate of climb, resulting in a 800 to 1000 ft/min climb rate. During the climb it is essential to watch oil and water (CHT) temperatures. Adjust the oil temperature regulator flap as required.

9.9 Supplementary Information

Flight training supplement

Climbing

Climbing while in cruise

If you have to climb in cruise, select an airspeed between 80 to 92 mph (70 to 80 kts). At these speeds, the aircraft will climb between 600 to 800 ft/min. depending on the weather conditions, altitude and weight of the aircraft.

It is strongly recommended to watch oil and water (CHT) temperatures. Under no circumstances should any of the engine temperature limits be exceeded, otherwise, an engine failure may result.

Emergency climbing

If you have to climb at a maximum angle due to any circumstance, we recommend to establish an indicated airspeed of 57 to 63 mph (50 to 55 kts) with maximum power setting of 5800 RPM. This will give you the maximum angle of climb at a minimum horizontal speed. Watch engine temperatures during the climb.

9.9 Supplementary Information

Flight training supplement

Cruise

Normal cruise

The maximum continuous cruising speed in level flight and calm weather conditions is 123 to 128 mph (107 to 110 kts). To achieve these airspeeds, a 75% power setting is required, which results in an average fuel consumption of 3.8 to 4.5 gallons per hour. Fuel consumption is variable, depending on external circumstances like temperature, air pressures and payload of the aircraft.

The most effective economic cruise speed is at an indicated airspeed of 115 mph (100 kts). At this speed fuel consumption of 4.2 gph or less will result, giving you a maximum range up to five hours of flight time.

Once the aircraft is trimmed well, it will maintain its altitude and heading without doing any corrections to the control stick for extended periods. If required, the aircraft is capable of achieving an airspeed up to 138 mph (120 kts) at full power setting. If doing so, it is strongly recommended not to exceed the maximum continuous engine rpm for more than five minutes. (Please refer also to the latest engine operators manual).

Cruising in gusty conditions

When flying in gusty weather conditions the maximum permissible airspeed of 115 mph (100 kts) should not be exceeded for safety reasons. The Allegro offers very stable flight characteristics even in heavy weather conditions, similar to that of a Cessna 172.

Stall

The Allegro is fully controllable when flying at a wide range of airspeeds, however if the slower speed limits are exceeded, the aircraft will display very stable stall characteristics. If the airspeed is reduced by the pilot gradually pulling back on the control stick, aerodynamic buffet will occur, indicating that the aircraft is approaching the stall speed. Should the aircraft then be allowed to stall, the aircraft will remain controllable and the maneuver will result in a gentle and stable nose over and begin to fly again. The aircraft can be stalled both with flaps extended and retracted.

Conducting a stall maneuver does not require special skill, nevertheless, if not yet familiar with the aircraft we recommend to do this exercise only when accompanied by an experienced flight instructor for the first time.

9.9 Supplementary Information

Flight training supplement

Slip

The slip is a very stable flight condition and is also very easy to perform. The maneuver is used to increase aerodynamic drag to enable a high rate of descent.

Before establishing a slip you have to ensure that the airspeed is within the required limits, the maximum permissible indicated airspeed of 86 mph (75 kts) (V_A) should not be exceeded and if performing a slip with flaps extended, a maximum indicated airspeed of 70 mph (61 kts) (V_{FE}) must be maintained. You will achieve the maximum descent rate at an indicated airspeed of 63 mph (55 kts) with flaps extended fully.

Conducting a slip will not require special skills, nevertheless, if not yet familiar with the aircraft, we recommend to do this exercise only when accompanied by an experienced flight instructor for the first time.

Gliding

The aircraft can glide well with the engine in idle or switched off. Best glide ratios are achieved within an indicated airspeed of 63 to 75 mph (55 to 65 kts). These speeds will establish a glide ratio between 1:12 to 1:13 with the flaps retracted (0° position).

Descent

When descending from level flight it is important to watch engine temperatures. During descent, the temperatures will decrease, which could cause engine failures or carburetor icing to develop.

So it is strongly recommended not to exceed the lower limits of these temperatures.

9.9 Supplementary Information

Flight training supplement

Approach

Approach under normal conditions

Always land on the most suitable runway, consider the wind direction, size of the runway, obstacles on the approach etc. Avoid airspeed above 75 mph (65 kts) or below 55 mph (48 kts) when on final. Due to the excellent gliding performance of the Allegro, high airspeeds would not be helpful during the flare and would extend landing.

CAUTION

Approach under tailwind conditions - Prohibited

Approach in crosswind conditions

Cross-winds will not have a big effect to the flight characteristics of the Allegro as long as wind speed stays within the maximum permissible speed of 12 mph (10 kts). Conducting a cross-wind landing does not require special skills, nevertheless, if not yet familiar with the aircraft, we recommend to initially exercise crosswind landings only when accompanied by an experienced flight instructor until sufficient experience has been gained.

Approach in turbulent weather conditions

If turbulences are indicated or wind shifts are expected, we recommend to establish an airspeed of 65 mph (56 kts). This will give you a reserve airspeed to balance any unexpected deviations in altitude and heading. In more gusty conditions it may be beneficial to stabilize the glide slope by keeping the flap setting to the #1 (15°) position. Increasing airspeed above 65 mph (56 kts) will not be helpful to stabilize the aircraft, so this should be avoided.

9.9 Supplementary Information

Flight training supplement

Approach in rain showers

Raindrops on the wind surfaces influence the aerodynamic characteristics of the airfoil, drag will increase while lift decreases. The airfoil used on the Allegro 2007 features stable flight characteristics in rain conditions. So there are not special advisories for flights within rain, we recommend to operate the aircraft like in turbulent weather conditions.

Approach

Approach in the slip configuration

If a high descent rate is required on final, we recommend that you conduct a slip manoeuvre.

Do not push the control stick forward, this will cause high airspeeds and result in a missed approach.

Conducting and approach in the slip configuration will not require special skills, nevertheless, if not yet familiar with the aircraft we recommend to do this exercise only when accompanied by an experienced flight instructor for the first time.

9.9 Supplementary Information

Flight training supplement

Touch down

Touch down under normal conditions

Landing the Allegro is much easier than landing many other aircraft. The aircraft has very good low speed characteristics and so is very controllable at the way through the landing phase. After a good approach has been conducted the Allegro does not require much action to result with a perfect touch down.

It is important to establish a safe and stable airspeed during the approach. The approach should be made at speed between 60-70 mph.

CAUTION

Touch down in tailwind conditions - Prohibited

Approach in crosswind conditions

Cross winds will not have a bad effect to the landing characteristics of the Allegro as long as wind speed stays within the maximum permissible speed of 12 mph (10 kts).

9.10 Information the owner can use for:

9.13 Owner change of address or sale

Contact Details

Contact Details for each customer or change of ownership, these details MUST be filled out in this manual and copy sent to distributor, info@fantasyairusa.com

ORIGINAL OWNER

Owners Name: _____

Address: _____

Phone Details: _____

Email Contact: _____

Aircraft Serial No: _____

Aircraft Registration No: _____

Country Registered: _____

Aircraft Color: _____

Aircraft Hours: _____

CHANGE OF ADDRESS or SALE OF AIRCRAFT

Owners Name: _____

Address: _____

Phone Details: _____

Email Contact: _____

Aircraft Serial No: _____

Aircraft Registration No: _____

Country Registered: _____

Aircraft Color: _____