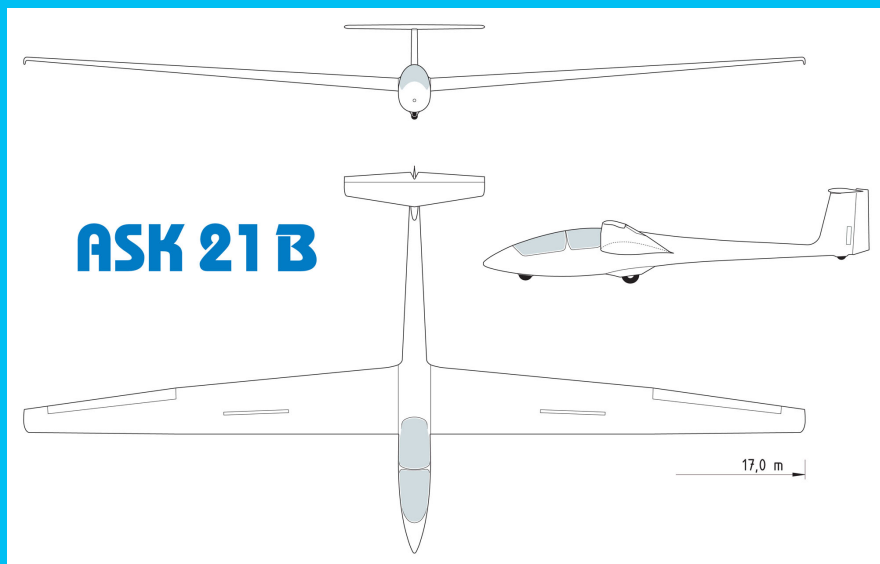


PILOT BRIEFING

ASK21B

N211MS



BY MSS



© Original version by Burt Compton, Modified for GBSC by G. Young, Andrew Watson, Bob Fletcher, David Fisichella, Mike Long, Tony Verhulst.

Rev: 07/2020

Reviewed and edited by: Gyorgy Gulyas, MSS CFG

Memphis Soaring Society
101 CR 338
Cherry Valley, AR 72324

FAA Identifier: 4AR5 - "Lawrence Field"
CTAF: 123.3 MHz
Gilmore VOR: GQE 276 degree 13.6 NM
LAT/LONG: 35 22.3'N 90 45.2'W
Runways: 07/25
Dimensions: 3625 x 300 ft.
Surface: Grass

www.Memphis-Soaring.org

Basics	4
Know the Differences	5
ASK-21B Canopies	7
Ground Handling	10
Aerotow	13
Pattern Planning	15
Landing Technique	17
P.I.O.'s.	19
Slips	21
Wheel Break	22
Stalls	23
Spins	24
Electrical system	26
Instruments	27
Instruments Panels	29
Flight Controls	32
Rudder pedals adjust–Ventilation–Seats–Headrest	33
Weight & Balance	34
Rigging / Derigging	36

BASICS

The ASK-21B is known worldwide as the best sailplane available for initial flight training through solo to license, and for fun soaring. It has a fair glide ratio (34 to 1) and a low minimum sink rate (128 fpm @ 42 kts) that allows the “K-21” to climb in weak thermals.

It is required that all pilots read this document and familiarize themselves with the ASK-21B Pilot Operating Handbook (POH) before being checked out in this glider. Copies of the POH, Becker 4201 Radio, & S100 Vario meter manuals are available on-line, here:

<http://www.memphis-soaring.org/training>

Learn the location of the controls, trim, release, wheel brake, etc.

Learn how to close and lock the canopies – **The rear canopy must close first.** Use the Pre-Flight (and post-flight) Checklists.

1.

KNOW THE DIFFERENCES

The ASK-21 is obviously different than the Blanik L-23 or the Schweizer gliders. Every glider you will ever fly will likely have significant differences, especially in landing technique, canopy latching, location of wheel brake, trim and release levers.

THE GOOD:

- Fair Glide Performance: 34 to 1 at 56 knots (dual) / 52 knots (solo)
- Lower Sink Rate Solo: 128 feet per minute at 42 knots
- Getting In and Out is easier as the glider dips down on its nose wheel.
- Harmonized Controls and easier to fly on tow.
- Does Not Easily Spin (but it will dive out or spin in skidding turns.)

THE DIFFERENCES

(Not “bad”, just different from a Blanik or a Schweizer 2-33.):

- **Canopies Must Always Be Closed.** Hinges can be damaged by wind.
- **Rear Canopy MUST BE closed and latched FIRST**, before closing and latching the front canopy. Both latches completely forward and “clicked.”
- The Spoiler Detent takes much more force to close & open than the L-23. If you don't hear and feel the solid lock when closing, you have not closed them.
- Wheel brake is activated by the airbrake handle – full back (airbrakes out.) **Do not touch down with full airbrake** or the wheel will be locked.
- Fuselage has three wheels. On takeoff or landing roll it is impossible to steer when not balanced on the main wheel.
- Ground Handling. Tailwheel does not swivel. Push down on nose to turn.
- Getting In and Out, it dips onto its nose wheel when loaded.
- Landing Technique. **Glider must be landed on main and tailwheel together.**
- P.I.O. on takeoff is prevented by never letting the nose wheel touch the ground – balance on the main wheel as soon as aileron and rudder control is gained. Leave on the nose wheel longer on the ground in strong cross wind and tail wind situations that may initiate a ground loop.
- P.I.O. on landing is prevented by never letting the nose wheel touch the ground – aim to execute a fully held-off, full stall landing, do not fly it onto the ground.
- **8 knot max crosswind component**, so keep it straight on landing roll-out. (This is the strongest crosswind encountered during the certification, the ship has been flown in much stronger cross winds) Note: experienced operator says it is very conservative, they happily operate their K21s with 90 degree cross-winds of 12 knots or so.

2.

ASK-21B CANOPIES

The front canopy opens forward, rear canopy opens back. All Glider Canopies are very susceptible to damage to the hinges or frames by wind and careless or rough handling by pilots and passengers. A canopy slamming down can crack the clear Plexiglas. Make sure the passenger never touches the canopies!

Again: Please make sure the passenger never touches the canopies.



Both canopies MUST BE CLOSED at all times, except when getting in and out. Even walking a few feet away to hook up the ground or aero tow rope will leave the canopies exposed to damage.

When sitting in the glider on hot days waiting to launch, one hand must be constantly holding the canopy. Close the canopies in sequence (rear first) and slowly.

THE CANOPY RULES!

- Canopies must be closed and locked at all times.
- **CLOSE AND LOCK THE REAR FIRST!!!**
- Always close and lock the canopies when ground towing.
- Please never touch the clear plexiglas for any reason.
- **Never lift a canopy by the plexiglas or the open vent window.** Again: Never lift a canopy by the plexiglas or the open vent window.
- Do not scratch the canopies with your (nor your passenger's) rings, watches, belt buckles, cellphones, hat buttons, cameras.

The Rear Canopy Must Be Closed and Locked First. The front canopy rear pins slide into white plastic blocks which may assure the rear canopy is locked down before takeoff. Closing the front canopy first (with the rear canopy open) will damage the plastic blocks. Take a good look at the canopy hinges, levers and locking devices. Learn how they work and keep the canopies closed at all times, rear canopy first!

Don't attempt to lock far-side locks when the glider is unoccupied.

Reaching through the vent window to operate the right side locking levers has potential to cause cracking of the canopy around the vent window.

Before takeoff check the front canopy pins have engaged the white plastic blocks behind you on each side, so the rear canopy is locked down. This will assure it will not open in flight.

Fire Danger: Open canopies have been known to focus the sunlight (like a magnifying glass) and create a hot spot on the interior, causing a fire. Most K21s I've seen have scorch marks on the rear headrest where the inside of the opened parabolic rear canopy has focused the sun. Really!



3.

GROUND HANDLING

The wingspan is 17 meters which is 55.77 feet. The wings are longer than the Blanik's wing span, which is 53.15 ft without the extensions. Always move the glider slowly in or out. Helpers giving a "thumbs up" at each wingtip is better than verbal OKs.

Since we must always keep both of the canopies fully closed, moving the ASK-21B means we will usually push it backwards by the nose or wing root. **Do NOT push on the canopy.**

To push the glider forward, leave the canopies closed and push from behind the wing, palms flat on the top of the wing, near the spar. (Remove rings. Do not scratch the glider with your belt buckles, rings and watches.)

Pushing gently down on the nose lifts the tailwheel so you can turn the glider. **Do NOT SKID the tailwheel sideways** — you will damage the wheel rim. Do not try to turn the glider by the wingtip without having a helper push down on the nose or lift by the rear fuselage. **NEVER lift a glider by the tip of the horizontal stabilizer / elevator!**

The ASK-21B may use a removable tail dolly. Always remove it before flight, and **never leave the glider with the**

tail dolly still attached, as it may swing quickly in a wind gust.

Getting In and Out. The ASK-21 sits lightly on the tailwheel when empty. It dips down onto the large nose wheel when you get onboard. To keep the glider from banging down onto the nose wheel, push down on the cockpit side rail and then get in. Getting out, push down on the cockpit side rail to keep the tail from banging back down. Close the canopies immediately, rear canopy first.

Be particularly careful getting in and out of the back seat in a high wind, as the rear canopy flails around on its struts. Under such conditions, consider waiting for a ground handler who can hold the rear canopy before opening it to get in or out.

If you or your passenger needs a handle, the fuselage “hoop” is strong but not to be grabbed at the very top – use the lower sides of the hoop by the fuselage.

Do not unnecessarily expose the aircraft to strong sunlight. The 2-pack acrylic paint finish provides a significantly improved weathering resistance. Although, regular care is still required to maintain the good appearance and the value of the aircraft.

At the end of the day, please clean the glider — if you flew it, don't forget to clean it.

For the care of the paint finish, only preparations containing the lowest available amount of silicone may be used.

The Acrylic Canopy should only be cleaned by means of a special cleaner (e.g.: Plexus Kunststoffreiniger or Acryshield) or with lots of clean water. On no account should a dry cloth be used for dusting or cleaning.

Pre-Takeoff Runway Alignment. Before takeoff, the ASK-21B will be resting on its nose and main wheels. At the start of the takeoff roll, the glider will go in the direction it is pointed, so always align the glider towards the towplane before getting in. **At low speeds without rudder and elevator authority, it will roll wherever it was pointed!**

Landing Alignment and Rollout. Aim the glider to round-out (flare) at the very center of your landing zone. Try to hold the nose up at touchdown, but it will quickly slow and dip over onto the nose wheel. Apply wheel brake by pulling full aft on the airbrake handle as needed.

Crosswind landings. With only an 8 knot max demonstrated crosswind, the ASK-21B will “weathervane” into the wind, even when on the nose wheel, as the rudder is small, and the tail is up in the crosswind when the nose is down on rollout. Be ready! Do not relax on rollout. Use the wheel brake (full aft airbrake) as much as required. Continuous hard braking may overheat the brake pads, reducing effectiveness.



4.

AEROTOW

For Aerotow, a weak link according to the tow plane must be used, not stronger than 2248 lbs (1000 daN $\pm 10\%$).



The detent to lock the airbrakes closed is very stiff and well-defined.

Make sure the airbrakes are locked in the detent before starting takeoff roll.

There are wheels on the wing tips.

The ASK-21B flies well on aero-tow. Typical aero-tow speed is 60 knots. It is “slick” so rope slack may occur in rough air. Use the “yaw away from the rope” or ½ airbrake method to gently remove the slack. Release if slack is excessive.

- Fly just above the towplane wake.
- Match the bank of the towplane and keep the towplane just above the horizon.

Flights in conditions conducive to lightning strikes must be avoided as these are not covered by the airworthiness requirements for type certification.

5.

PATTERN PLANNING



ASK-21 on final approach, before “round-out” or flare to land on main and tailwheel. Use about $\frac{3}{4}$ Airbrake, 55 knots max. through the “mail slot” at the end of the runway.

This is business as usual like in the Blanik. As a general rule, keep the airspeed at 50 knots, “plus half the wind speed” and check the variometer to see if you are flying in lift or sink. This is essential. 3-5 Knots down works well on the downwind leg and early base leg. Glance at the trends of the airspeed and variometer. Check your angles to the aim point, touchdown and stop points. If needed, increase your sink

with the airbrakes on final approach to over the end of the runway with $\frac{3}{4}$ airbrakes.

Note: If flying in a strong wind with a lot of wind gradient, don't hesitate to use 60 knots or more to ensure you have enough speed at all stages of the approach.

The "yellow triangle" on the airspeed dial at 49 knots indicates minimum final approach speed at maximum weight.

The ASK-21B does exhibit mild, but noticeable pitch changes when deploying airbrakes. Nose down when opening, nose up when closing.

6.

LANDING TECHNIQUE

Unlike the Blanik, **you WANT to touchdown on both the main wheel and tailwheel at the same time.** At round-out / flare, hold the glider a bit nose up so you land only on the main and tailwheels. **Never let the nose wheel touch** until the glider slows and dips down on its own. Excess speed will also contribute to P.I.O.'s. Do not force the glider onto the runway.

Correct landing attitude. Main & tail wheel will touch simultaneously. Nose held up.



And this is the Wrong way! Nose wheel may touch, rebound up, and start the three wheel P.I.O.!

Please note, making anything other than a two-point (or tail-slightly-first) landing will result in a mandatory check flight with an instructor, regardless of pilot qualification.



7.

P.I.O.'S.

The “three wheel” gliders such as the ASK-21 or Grob 103 can get into very severe Pilot Induced Oscillations if the nose wheel is allowed to touch the runway soon after touchdown. If you have been flying a Blanik or Schweizer 2-33, you must change your landing technique to **always land the ASK-21 on the main and tailwheel, and never let the nose dip onto the nose wheel** until it slows down and dips on its own on rollout.

Landing on the tailwheel first is allowed! At 5 feet, hold the glider just off the ground with a bit of back pressure on the stick and let it settle to the runway, then open the airbrakes fully and hold the stick back.

Do not loosen your grip and relax — do not let the stick go forward and do not allow the glider to dip onto the nose wheel.

If the nose wheel touches, the nose may bounce back up, the tailwheel hits, bounces and then the nose wheel hits and bounces . . . it will gallop like a wild rocking horse down the runway and may break the fuselage. Ugly.

Try to stop the P.I.O. by holding the stick firmly and steady in one position. It is not easy as your body is flung forward and back, and the P.I.O. may continue on its own. Applying

full airbrakes which also applies the wheel brake may help stop the P.I.O. but if bouncing high, closing the airbrakes may prevent a subsequent hard landing.

If a P.I.O. or hard landing occurs, you must immediately inspect the bottom of the fuselage for cracks, and the wheels for damage. Often the rims get flattened and the wheels will not turn. Ground the glider until the damage can be evaluated.

Proper Landing Technique is Tailwheel and Main together — Don't relax and let the stick move forward. Excess speed on touchdown may cause a P.I.O. so manage your landing energy on downwind and base legs to 50 to 55 knots and no more!



8.

SLIPS

A slip is defined as a method to lose altitude without gaining airspeed. A full slip will meet this goal if you **do not let the nose drop**. Hold the nose on the horizon in your normal glide “picture.” Slipping nose low will cause the airspeed to increase, and when you come out of the slip, you will be flying much too fast on final. It is best to set a pitch attitude prior to beginning the maneuver, as the airspeed indication goes to zero in a fully developed slip.

A **preset attitude** is your only way of knowing that you have an acceptable airspeed. A “Left Slip” is with the left wing down, right rudder. (Right slip is the opposite.)

Note: The ASK-21B rudder in a slip will tend to stay full over until you actively push it back to neutral. (In some gliders, the rudder returns to neutral on its own.)

9.

WHEEL BREAK

The ASK-21B main wheel disc brake is activated when you pull the blue airbrake handle fully back (full airbrakes). Touching down with the airbrakes held fully back (“on”) may cause the main wheel to lock and skid the tire. This may also cause the tube to slip around inside the tire and break the air valve. Apply wheel brake after touchdown and use it generously, especially in a crosswind.

Since the wheel brake is on the airbrakes, we cannot push or ground tow the ASK-21 with the airbrakes tied fully open.

In a strong wind, put a pilot into the front cockpit.

10.

STALLS

The stall will usually occur **in this order**:

1. **“Excessive back stick pressure”**
2. **“Nose high attitude”** but not always above the horizon.
3. **“Low airspeed indication”** — drops under 40 knots.
4. **“Quietness”** (wind noise is less.)
5. **“Mushy controls”** — especially the ailerons.
6. **“Buffeting”** — The airflow is separating from the wing.

Stall Recovery: Release Back Pressure on the stick.

- Release back pressure on the stick if you notice any of the six items above. Note that full forward stick may cause the glider to tuck inverted.
- Stop any turning (yaw) during the stall with a small amount of rudder.

Stalls in turns, and with airbrakes open, will occur “sooner” (higher airspeed.)

Stall with airbrakes: Release back pressure and smoothly close the airbrakes.

Stalls and spins may occur on your skidding turn to final, a skidding turn back after a low “rope break”, or while thermalling in a skidding turn.

11.

SPINS

The ASK-21 is advertised as being reluctant to spin, but that does not mean it will not spin!

Pilots who think the rudder is needed to turn a glider may find themselves in a spin. **Banking with aileron turns a glider – never try to turn a glider with excess rudder.** Excess rudder starts a dangerous skidding turn and can develop quickly into a spin.

Remember . . . There are NO “Spin Proof” Gliders! (Make no skidding turns.)

The ASK-21B Flight Manual describes the 5-step spin recovery technique, specifically **in this order**:

- 1. Check ailerons neutral**
- 2. Opposite Rudder** to the turn. “Stop the Turn.”
- 3. Short Pause.** (hold control inputs for about 1/2 spin turn). Ignoring the pause may delay the recovery!
- 4. Ease the stick forward to neutral** (means, give in to the pressure of the stick) until rotation ceases and sound airflow is established again — but not full forward. Full forward stick may delay or even prevent the recovery!
- 5. Center the rudder and ease out of the ensuing dive**

The altitude loss from the beginning of the recovery until the normal flight attitude is regained is about 260 ft.

Spin Weights For spin training, MSS has the optional spin weights that can be bolted to the rear of the fuselage. They move the Center of Gravity aft so the ASK-21 B spins easily. These are to be attached **only under the supervision of the Duty Instructor**. Leaving the tail dolly on may also cause the glider to spin. See pictures on pages 30 and 35.

Spin Weights must be removed immediately after the spin training flights.

Before every takeoff, confirm the spin weights and tail dolly are removed.

SPIRAL DIVE RECOVERY

Depending on the aileron position in a spin, with forward CG. positions in which the ASK 21B cannot sustain a steady spin it will immediately or after a few turns develop into a spiral dive or a slipping turn similar to a spiral dive.

In contrast to a spin, a spiral dive is characterized by high G-loads. Therefore, do not pull the stick further back, but: if in a turning / spiral dive, level the wings first, then gently pull back and pitch up to level flight. Pulling back in a spiral dive will only tighten the spiral and increase the wing loading.

See Flight Manual for more information:

- pages 4.12–4.20;
- pages 9.1, Supplement A.1, B.1–B.9.

12.

ELECTRICAL SYSTEM

All components factory installed.

BATTERIES. Two battery boxes were installed at the factory, secured in the left wing root, and accessible from the back seat.

The battery selector switch on the front instrument panel also serves as the main switch.

A switch on the front panel turns the power on for the radio and instruments.

Make sure it is turned off after last flight and remove the battery and put on charge.

See Flight Manual for more details — page 7:12.

13.

INSTRUMENTS

In each panel, there are a factory installed 80 mm ‘Winter’ Airspeed Indicator, a 57 mm “Winter” Altimeter in feet and knots and an Accelerometer. In the front panel there is also C2300 Magnetic Compass.

LXNAV S100 ELECTRIC / AUDIO VARIOMETER

In the center of each instrument panel there is a 80 mm LXNAV S100 digital speed-to-fly variometer, final glide calculator and navigation system and flight recorder. It can display waypoints, airspace and can be used to navigate to waypoints around tasks, can display glide information. It has color a display which can show parameters such as vario average, thermal average, distance to goal, altitude, battery level, speed-to-fly, push/pull indicator, MacCready setting, etc.. The system is compensated to reduce “stick thermals” by a Total Energy Venturi-probe located on top of the fuselage, behind the wing.

The Vario will have a standard club configuration that should suit all instructional, intro, and other club flights. This configuration should not be changed.

NOTE: If you feel the need to change the configuration for your flight, YOU are responsible for reconfiguring the instrument back to the standard club settings.

In order to get the maximum benefit from this flight computer system, please visit our training website and study the available manuals and tutorial videos:

<http://www.memphis-soaring.org/training>

BECKER AR 4201 RADIO

The Becker manual is also available on our Training website.

The radio is installed in the front instrument panel and there are flexible boom mic's with a PTT switch on the front and rear sticks and on the rear instrument panel. It is the same type of radio we have in the L23, 1-26 and Tow 2.

Study the radio features to learn how to use it. Make sure you transmit on the correct frequency. Battery voltage is shown on the face of the Becker by pressing the Mode button

Quick Reference Data

1. Turn on sailplane electric first.
2. Turn on the radio by the volume knob.
3. Press Squelch button to check speaker volume for back seat pilot.
4. Press Mode button to find the voltage check mode for batteries 1 & 2.
5. Press Mode button to go to the “flip-flop” frequencies and pre-set.
6. The “arrow” button switches the “flip-flop” frequencies.
7. Always keep the radio on while on the taxiway or runway to monitor traffic.

If the voltage drops below 10.5 volts, the LCD will flash. In Mode 3, the supply voltage is displayed in the bottom line of the LCD.

14.

INSTRUMENTS PANELS

Front Instrument Layout (panel, from top left):

- Fuses, Airspeed Indicator, Altimeter
- Main Electrical Switch - Battery Selector, Ram Mount, LXNAV S100 Main Unit, Accelerometer, Compass
- Becker 4201 Radio



- Spin Ballast Fairing Locking Knob (Ballast Installed / Not Installed Reminder, see on the right and Flight Manual page 4.17.)



Rear Instrument Layout (panel, from top left):

- Airspeed Indicator, Altimeter
- Ram Mount, LXNAV S100 Repeater, Accelerometer,
- Push-To-Talk Switch, S100 Circuit Breaker



15.

FLIGHT CONTROLS

Standard Euro Colors.

- Blue: Airbrakes / combined Wheel Brake
- Yellow: Tow Release
- Green: Trim (by control stick)
- Red: Canopy Emergency Release (for bailout.)
- White: Canopy Latches.

16.

RUDDER PEDALS ADJUST- VENTILATION-SEATS-HEADREST

The rudder pedals are adjustable, the rear ones before flight only.

Both seats have pivotable and adjustable ventilation nozzles. Both seats' backrests and headrests are adjustable before flight.

See Flight Manual for more details – pages 7.2, 7.3, 7.6, 7.7. and 7.8.



17.

WEIGHT & BALANCE

Empty Weight: 852 lbs

Max. Take-Off Mass: 1323 lbs

Max. Payload: 471 lbs

Min. Front seat weight: 154 lbs.

- It has to be regarded.
- If the front pilot is lighter than that, ballast plates can be fitted in front of the front seat. 30% of the rear pilot's mass can be added to the front pilot's mass.

Max. Front seat weight: 242 lbs.

- If the front seat weight exceeds 242 lbs, then the rear seat weight must be reduced with 5 times this amount of excess weight.

Max. Rear seat weight: 242 lbs.

- If the rear seat weight exceeds 242 lbs, then the maximum mass of 242 lbs of the front seat must be reduced by this amount of excess weight.
- The seat loading may not exceed 286 lbs in either seat.

For more information see Flight Manual Section 6.



For spin training, spin ballast can be mounted in the fin, see above. Use of spin ballast is only allowed with a payload of max. 242 lbs per seat.

For more information see Flight Manual Section 4.5.3.2.

Do not place anything behind the rear seat. Jackets, hats, bottles, booklets can fall down into the flight controls in the fuselage! You can place some small NON-METAL items in the left and right wing roots by the batteries.

18.

RIGGING / DERIGGING

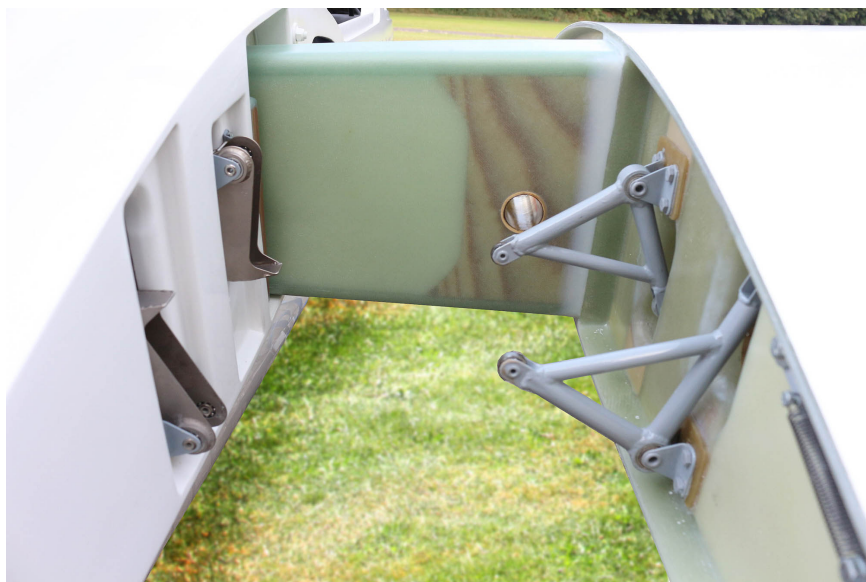
For more information see Flight Manual pages 4.2–4.4.

The ASK-21 B can be rigged and de-rigged without use of rigging aids by four people, or by three people when a fuselage cradle and a wing stand are used.

In a nutshell:

Airbrake lever shall be forward, stick centered.

- The left wing comes in first and insert its spar fork into the fuselage.





- Insert right wing spar root and line up the main pin bushings. Insert and lock main pins.
- Never insert the rear wing attachment pins prior to the main pins! A special T-tool is required for the rear pins.
- Automatically connected elevator and wing control surfaces.

During transportation:

In order to protect the air brake cover plates from damage the air- brakes must be closed and locked!

Under no circumstances should the elevator actuator on top of the vertical fin be loaded or fixed in any way, even by soft foam cushions!

