	Speed	IAS	Remarks
V_{FE}	Maximum **Flap Extended speeds**	1 – 2 – 3 – 4 270 km/h 146 kts 168 mph 5 – 6 180 km/h 97 kts 111 mph L 150km/h 81 kts 93 mph	Do not exceed these speeds with the flap in position of the given numbers.
V_W	Maximum **Winch-launching speed**	140 km/h, 75 kts 87 mph	Do not exceed this speed during winch- or autotow launching
V_T	Maximum **Aero-towing speed**	180 km/h 97 kts 111 mph	Do not exceed this speed during aerotowing.
V_{TA}	Maximum **Sustainer assisted aerotowing speed**	180 km/h 97 kts 111 mph	Do not exceed this speed during sustainer assisted aerotowing.
V_{LO}	Maximum **Landing Gear Operating speed**	180 km/h 97 kts 111 mph	Do not extend or retract the landing gear above this speed.
V_{PE}	Maximum **speed with propeller extended**	180 km/h 97 kts 111 mph	Do not exceed this speed with the engine extended
V_{PO} max	Maximum speed **for extending and retracting the propeller**	120 km/h 64 kts 74 mph	Do not extend or retract the retractable powerplant outside of this speed range
V_{PO} min	Minimum speed **for extending and retracting the propeller**	95 km/h, 51 kts, 59 mph	

2.13 Approved Launch Methods

Launching by Aerotow is approved using the towing release in the fuselage nose. Winch and Autotow launches are approved using the tow-release below the rear seat.

The ASG 32 El is not approved for take-off by sole means of its own power. Winch and Autotow launches have to be performed with the engine retracted. Aerotows can be performed either with engine retracted or with assistance by the own sustainer propulsion.

The flap settings 1 -3 are not permitted for Aerotow, Winch and Autotow launches.

The maximum permissible launch speeds are:

aerotowing	180 km/h (97 kts, 111 mph)
winch launch	140 km/h (75 kts, 87 mph)

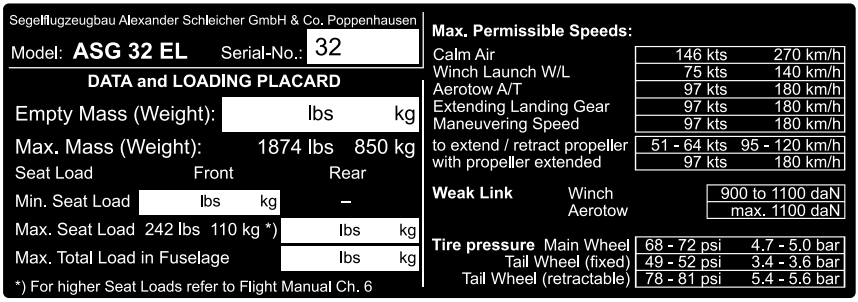
For winch launch, a weak link of 1000 daN ±10% (2248 lbs, black) must be used with the launch cable or tow rope.

For Aero Tow, a weak link according to the tow plane must be used, not stronger than 1000 daN ±10% (2248 lbs, black). Besides other regulations which may exist, the tow rope must be a textile rope not less than 40 m = 130 ft or more than 60 m = 200 ft in length.

Weak link colours are not binding; this information refers to the colour scheme of the Tost company.

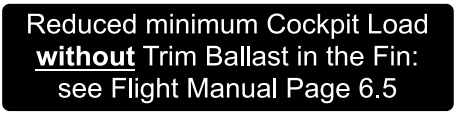
2.15 Limitations Placards

This placard is fixed to the right-hand cockpit sidewall and contains the most important mass (weight) and speed limitations. (The original placard is to be enlarged by 130%)

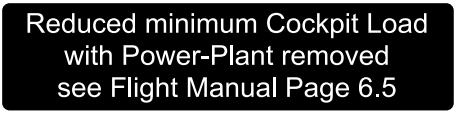


This placard is to be glued below the data placard:

This placard is to be glued near the data placard:



This placard is to be glued near the data placard:



This placard is to be glued near the data placard:

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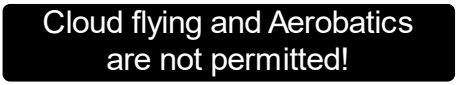


Emergency Retraction of the Power-plant

The following emergency retraction procedure can be applied, if the extended power-plant should fail and the additional drag is a serious danger for the further flight. A still sound 12V power supply of the power-plant is required for this.

WARNING
If the emergency procedure is applied, the propeller as well as the engine compartment doors will be unavoidably severely damaged!

- Power-plant main switch: OFF
- Press and hold the turn-push button of the power-plant instrument and switch power-plant main switch ON simultaneously (service menu is shown)
- Press the turn-push button once and turn one notch clockwise (field “retract” is activated)
- Press the turn-push button once (retraction starts)
- Wait approx. 10 seconds
- Press the turn-push button once (retraction stops)
- Power-plant main switch: OFF

Ground run

WARNING
Perform ground run with rigged aircraft only!

CAUTION
The freestream during flight is necessary for the proper air cooling of the propulsion like it is the case during normal operation as sustainer. The motor overheats after about 10 minutes ground run with a power setting of 100% and 20°C (68°F) outside air temperature. The operation limitations of this flight manual chapter 2.4 have to be met anyway.

CHECKLIST: Extending propeller and starting motor

- Battery emergency stop: OFF (= not pushed; release by turning)
- Power-plant main switch: ON (power-plant instrument on)
- Power lever: EXTEND (until the noticeable stop position)
- Observe correct extension process in the mirror, blue message „PRESS Starter Button“ appears, propeller holds in vertical position
- Check power-plant instrument for warnings
- Propeller area: CLEAR
- Wheel brake: ENGAGE (fully extended airbrakes)
- Starter: ENGAGE
- Adjust power-setting at the power lever as desired

CHECKLIST: Stopping motor and retracting propelle

- Power lever: 0% (until the noticeable stop position)
- Observe braking and vertical alignment
- Power lever: RETRACT (bottommost)
- Observe correct retraction process in the mirror
- Power-plant main switch: OFF

Sustainer assisted aerotow

The electric propulsion can be used to assist the aerotow, e.g. in case of short or wet airfields.

> ***WARNING***
> *The sustainer assisted aerotow is only permissible, if the aerotow would be also possible without the assistance of the gliders sustainer. The assistance serves to increase the safety margin only. Referring to the ground roll and take-off distance as well as the climb rate of the tow the same values as for the unassisted tow apply.*

> ***WARNING***
> *The state of charge of the propulsion battery has to be at least 70% to guarantee a sufficient amount of energy for the tow.*
>
> *The proper function of the electric propulsion has to be tested with a ground run before the tow. An indicated power of at least 26 kW as well as a speed of at least 2200 rpm have to be achieved with a power setting of 100% while stationary. See also page 4.10a.*

In general, all procedures and limits of the normal aerotow apply. In addition, the following has to be regarded:

- Recommended towing speed 100 – 120 km/h (54 – 65 kts, 62 – 75 mph), in case of towing speeds above 130 km/h (70 kts, 81 mph) the sustainer propulsion has no benefit anymore. Hence the sustainer should be stopped and retracted according the checklist of section 4.5.1 at a safe altitude in case of high towing speeds.

The following checklist provides a procedure for performing a sustainer assisted aerotow.

CHECKLIST: Sustainer assisted aerotow

- Power-plant main switch: ON (power-plant instrument on)
- Power lever: EXTEND (until the noticeable stop position)
- Observe correct extension process in the mirror, blue message „PRESS Starter Button“ appears, propeller holds in vertical position
- Pre take-off check
- Trim: NEUTRAL
- Attach tow rope
- Wheel brake: ENGAGE (fully extended airbrakes)
- Propeller area: CLEAR
- Starter: ENGAGE, motor still holds position
- Power setting 50% (≈ half travel / 12 kW)
- Tighten towrope (clear for take-off)
- During roll-up: retract airbrakes, power setting 100%
- Proceed like a normal aerotow

CAUTION
If the power lever is set to 0% after a motor run, means pulled down to the noticeable stop position, the propeller is held vertically by the motor. If then power is set again, the starter has to be engaged again to activate the motor run.

NOTE
The motor speed is limited at its maximum permissible value by the power electronics. This means, the motor cannot be overrevved even at high towing speeds.

Prepare together with the tow pilot how to proceed in case of an aborted take-off respectively engine failure for the different phases of the take-off prior to the tow. The local conditions of the airfield and weather have to be taken into account.

CAUTION

In case of a motor failure at the sailplane, a decrease in climb rate of the tow up to 1.5 m/s (300 ft/min) has to be taken into account. If necessary, the emergency retraction of the power-plant as per page 3.8 could be applied to improve this situation.

No matter which kind of occurrence appears, Fly the aircraft first! This means, control pitch and direction, check proper airspeed. The pilot of the sailplane can apply the following standard procedures:

CHECKLIST: Aborted take-off sailplane rolling on ground

- Release tow rope
- Power lever all way down
- Engage wheel brake
- Change direction, if necessary

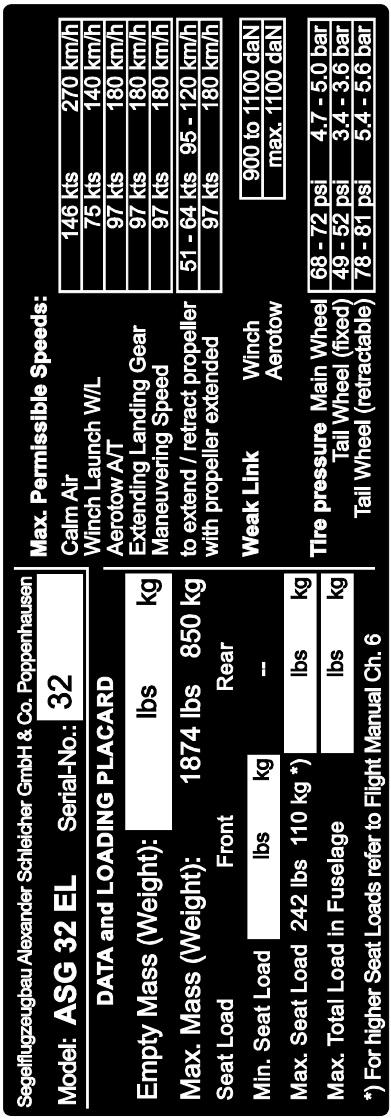
CHECKLIST: Aborted take-off sailplane landing straight

- Release tow rope
- Power lever all way down
- Extend airbrakes and perform a landing
- Change direction or perform a groundloop, if necessary

CHECKLIST: Aborted take-off sailplane climbing further solely

- Release tow rope
- Establish safe flight attitude and airspeed
- Perform a climb with V_Y
- Choose a traffic pattern, which guarantee a safe continuation of the flight

21



21a

22

This placard must be enlarged by 141%.

This placard is affixed below the Data and Loading placard (21).