

Weight & Balance considerations for the GROB G103s and ASK-21 can get just a bit confusing, largely because of the “method of presentation” to be found in the Flight Manuals. This presentation is partially intended as an attempt at identifying and clarifying certain of those Weight and Balance issues. First, note the following peculiarity:

From the Graphs provided herein, it may be seen that there exist areas well within that envelope defining overall fore and aft Center of Gravity and Maximum Gross Weight operating limitations, but within which the Flight Manual imposed constraints identified below effectively deny conduct of flight operations.

1. The Flight Manuals impose a 242 lb. Maximum Pilot Weight in either seat.
2. The Flight Manuals impose a 154 lb. minimum weight in the front seat for all flight operations. (*This should not be confused with “minimum front seat weight for solo operation,” which may be more than 154 lbs., but never less than 154 lbs.*)
3. The Flight Manuals offer no explanation for the above limitations, but it appears that EASA has (for whatever reason) established Operational Requirements corresponding to a specific Certification Requirement for two-place gliders (ref: CS 22.23 load distribution limits). Then, in the Twin II Acro, the 154 lb. minimum front seat weight limitation may be compensated for by the installation of one or both 12.3 lb. trim weights, but this action is not without a peculiarity of its own, which it may sometimes be necessary to take into account. A subsequent slide will go into more detail on this matter.

LOADING GRAPH PRINCIPALS:

The first graph displayed for each glider will outline the entire envelope within which the glider could operate without exceeding either Center of Gravity or Maximum Gross Weight operating limits.

Then, on both graphs, that limited portion of this envelope within which the Flight Manuals specify that all flight operations are to be conducted will be prominently outlined with a red border



The next two slides will show by example how the loading graphs that are herewith provided are to be interpreted and used

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Remember, these are only examples, and are therefore not to be taken as specifically representative of any particular USA owned glider



XXX

GROB 103
Twin II Acro
Nxxxx
Serial No.
xxxxxxx

This graph is
Based on the
weighing,
and the
Weight &
Balance
calculations
performed on
xxxxxxxxxxxx

E.W. = 916.0 lbs.
EWCG = +29.85
Useful Load = 363 lbs.

**Minimum Front seat
weight for solo - 170 lbs.**

Front Seat Weight - (Pilot + Parachute)

300
250
200
150
100
50

FWD CG
Limit
(+10.24")

Front Seat -
242 lbs. maximum

Permissible Operating Envelope

AFT CG Limit - (+18.11")

Front Seat -
154 lbs. minimum

In this example case, the
maximum rear seat weight is
210 lbs. In most cases, this
figure would be 242 lbs.

Maximum Pilot Weight, *either seat*, is generally 242
lbs. , but note that in this example case, the rear
seat weight is limited to 210 lbs.

Minimum Front Seat Pilot
Weight, *for all flight,* is 154 lbs.

Max Gross Weight Limit - (1279 lbs.)

50 100 150 200 250 300

Rear Seat Weight - (Pilot + Parachute)

XXX

GROB 103
Twin II Acro
XXXXXXXXX
Serial No.
XXXXXXXXXX

This graph is
Based on the
weighing,
and the
Weight &
Balance
calculations
performed on
XXXXXXXXXXXXXXXXXX

E.W. = 916.0 lbs.
EWCG = +29.85
Useful Load = 363 lbs.

**Minimum Front seat
weight for solo – 170 lbs.**

Front Seat Weight - (Pilot + Parachute)

300
250
200
150
100
50

FWD CG
Limit
(+10.24")

Front Seat -
242 lbs. maximum

AFT CG Limit - (+18.11")

Example: Two 170 lb. pilots

In this example case, the
maximum rear seat weight is
210 lbs. In most cases, this
figure would be 242 lbs.

Maximum Pilot Weight, *either seat*, is generally 242
lbs. , but note that in this example case, the rear
seat weight is limited to 210 lbs.

Minimum Front Seat Pilot
Weight, *for all flight*, is 154 lbs.

"Where We Are"

Front Seat -
154 lbs. minimum

Max Gross Weight Limit - (1,279 lbs.)

50 100 150 200 250 300

Rear Seat Weight - (Pilot + Parachute)

O.K. — Having experienced the demonstration, let us proceed on to individual loading graphs tailored to specific gliders - - -

These graphs will be provided in two different versions, one “very busy” with lots of notes and data, the other in an easier to use *expanded format* of just that part of the overall W&B envelope within which all flight operations are to be conducted - - -