

AEROPLANE FLIGHT MANUAL

SAAB 91B SAFIR

Nationality and registration marks:

Certificate of airworthiness:

Aircraft type:

Serial No:

Manufacturer:

Manufacturing place:

Manufacturing year:

This Flight Manual is approved by
THE ROYAL BOARD OF CIVIL AVIATION
Division of Civil Aviation Inspection
Ref: Letter Lui 2109/227 Nyr/ES of March 2, 1955

This Flight Manual must be kept on board the plane during flight. The manual shall include the latest Weight and balance report, List of basic equipment and Loading sheet.

Approved by
THE SWEDISH BOARD
OF CIVIL AVIATION

AEROPLANE FLIGHT
MANUAL
SAAB 91B SAFIR

TEMPORARY RESTRICTION

For aeroplanes provided with metal blade propellers engine speeds between 2080 and 2300 RPM are to be avoided.

DESCRIPTION

- Span: 34 ft. 9.3 in. (10600 mm)
Over all length: 25 ft. 11 in. (7900 mm)
Total height (static position): 7 ft. 2.6 in. (2200 mm)
Type of landing gear: Retractable main and nose gears
Max. number of persons (incl. crew) to be carried: 3 1)
Engine type: Lycoming O-435-A
Fuel type: Min. octane 80
Fuel capacity: 38,5 Imp. gallons (46,2 US gallons, 175 litres)
Oil capacity: 2,5 Imp. gallons (3,0 US gallons, 11,4 litres)
Propeller type: Hartzell HC-12x20-8C (or HC-12x20-8D) with plastic blades
8428-6 (pitch range 11.5°) or metal blades 8433-6 (pitch
range 15°)
1) in Aerobatics only 2 (in front seats)

CLASSIFICATION

The aeroplane is certified as belonging to following categories and sub-divisions:

Categories: Normal or Aerobatic

Sub-divisions:

- Sub-division (a): Public transport for passengers
- Sub-division (b): Public transport for mails
- Sub-division (c): Public transport for goods
- Sub-division (d): Private
- Sub-division (e): Aerial work
- Sub-division (h): Demonstration
- Sub-division (i): Crew familiarization

Note 1. Inverted looping, inverted spin and all inverted flight that is not part of an approved manoeuvre is not permitted.

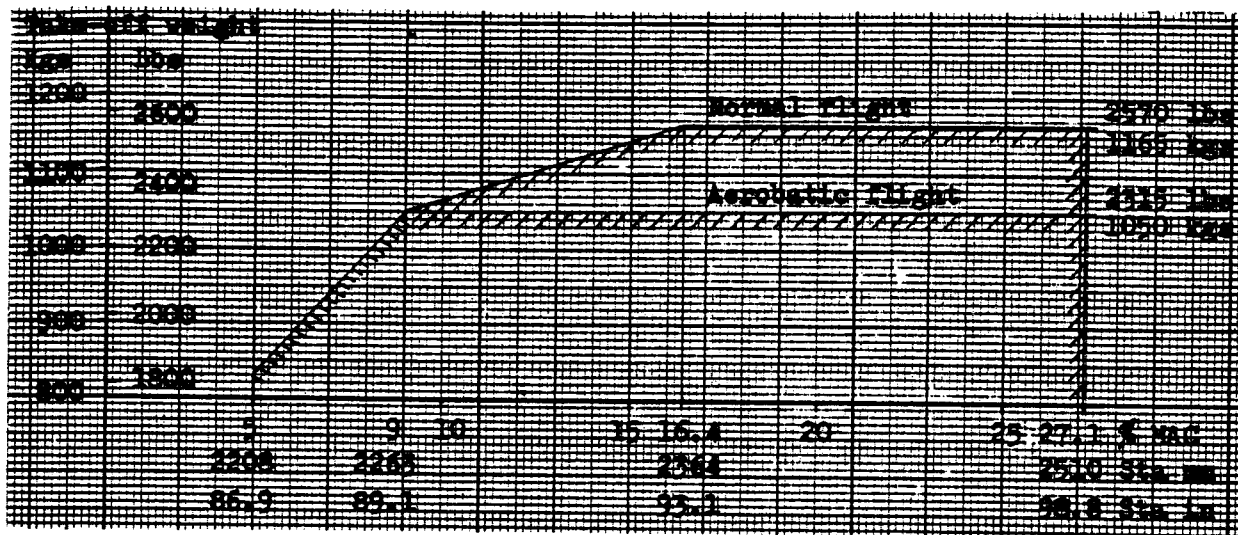
Note 2. The aeroplane is equipped for IFR flight to meet the requirements in the Swedish BCL-D 1.9 of September 1, 1949.

The aeroplane is equipped for instrument flight
The aeroplane is equipped for night flight
The aeroplane is not equipped for flight in icing conditions

Note 3. Stalls may be carried out in Normal Category.

CENTER OF GRAVITY POSITIONS AND WEIGHTS

Center of gravity limits (within area indicated)



Max. take-off weight for normal flight: 2570 lbs (1165 kg)

Max. flying weight for aerobatic flight: 2315 lbs (1050 kg)

Note 1. For distribution of the load at various loading alternatives, see Loading directions.

Note 2. The aeroplane is provided with the equipment specified in the List of basic equipment.

RESTRICTIONS

Temporary restrictions: See page 1a.

Engine Lycoming O-435-A: Max. engine speed 2550 RPM.

Max. overspeed 2600 RPM.

Mixture control should be in RICH position below 5000 ft (1500 metres).

Engine instruments: Oil thermometer

Normal range: 10-107°C (green arc)

Non-permissible: above 107°C (red line)

*

Note: Engine is warm enough for take-off when the throttle can be opened without backfiring or skipping of the engine.

Oil pressure indicator

Normal range: 65-85 psi (4.6-6 kp/cm²) (green arc)

Non-permissible: below 65 psi (4.6 kp/cm²) (red line)
above 85 psi (6 kp/cm²) (red line)

Fuel pressure indicator:

Normal range: 0.5-6 psi (0.04-0.42 kp/cm²) (green arc)

Non-permissible: below 0.5 psi (0.04 kp/cm²) (red line)
above 6 psi (0.42 kp/cm²) (red line)

Tachometer:

Normal range: 1900-2550 RPM (green arc)

Non-permissible: above 2550 RPM (red line)

Airspeed indicator: (IAS)

Normal range (V_{S1} - V_{NO}): 73-162 MPH (63-140 knots, 118-260 km/h)
(green arc)

Caution: 162-213 MPH (140-185 knots, 260-342 km/h) (yellow arc)

Max speed (V_{NE}): 213 MPH (185 knots, 342 km/h) (red line)

Range for flying with flaps

fully down (V_{SO} - V_{FE}): 64-95 MPH (56-83 knots, 103-153 km/h)
(white arc)

Wing flap positions

Take-off	-	down 17°
Up	-	fully up
Down	-	down 43°

Maximum speeds (IAS)

Dive	213 MPH (185 knots, 342 km/h)
Lowering flaps	99 MPH (86 knots, 159 km/h)
Flying with flaps fully down	95 MPH (83 knots, 153 km/h)
Lowering landing gear	109 MPH (95 knots, 175 km/h)
Flying with landing gear down	137 MPH (120 knots, 220 km/h)

Approved aerobatic manoeuvres with recommended entry speeds (IAS):

Roll	109 - 134 MPH (95-116 knots, 175-215 km/h)
Looping	152 - 168 MPH (132-146 knots, 245-270 km/h)
Top roll	168 - 190 MPH (146-165 knots, 270-290 km/h)

Half roll 90 MPH (78 knots, 145 km/h)
 Spin Stalling speed

Note. Ailerons with spin will give a remarkable increase of rotation speed.
 Max. cross-wind component 19 MPH (16.5 knots, 30 km/h)

PERFORMANCE

The performance figures below are given under the following conditions:

1. Flying weight: 2570 lbs (1165 kg)
2. Take-off and landing on concrete surface
3. No wind
4. Airplane equipped with variable-pitch propeller type Hartzell HC-12x20-8C (or HC-12x20-8D) with plastic blades
 Note. Performance with plastic and metal blades is the same where otherwise not stated.
5. Engine Lycoming O-435-A
6. Cooling air shutters in position hole no. 3

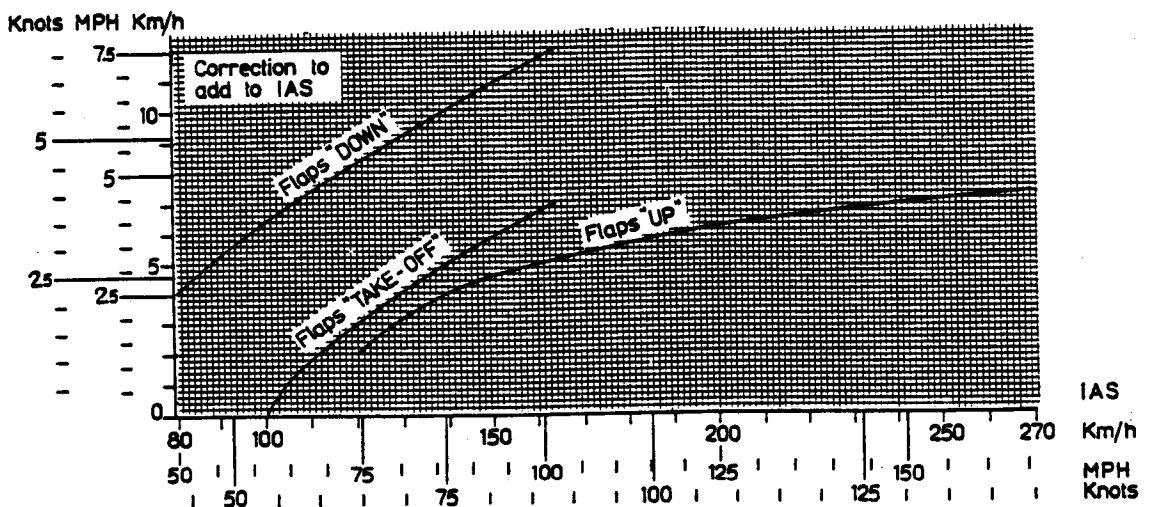
CRUISING SPEED

Cruising speed is decreased appr. 3 MPH (2.5 knots, 5 km/h) when the cooling air shutters are extended to hole no. 4.

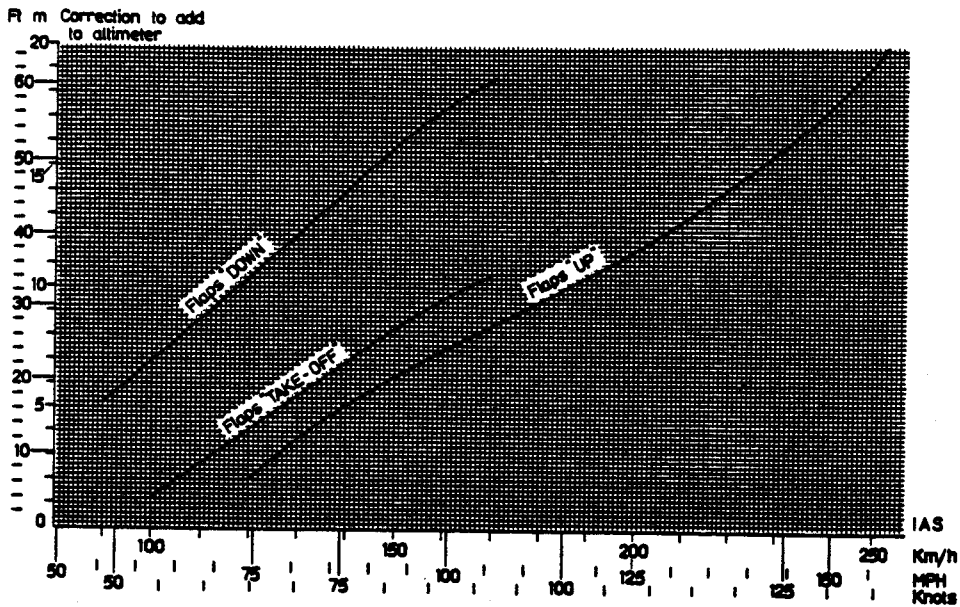
Note. Cruising speed is increased appr. 2 % with propeller equipped with metal blades.

CALIBRATION CHARTS

Airspeed corrections. (Static position errors.)



Altitude corrections (Static position errors)



Up to 10.000 feet (3000 metres), altitude will have no considerable influence on altimeter corrections.

TAKE-OFF DISTANCE TO 50 FT. (15 M) HEIGHT

Flap position: TAKE-OFF

Take-off safety speed: See page 9

Airfield situation above sea level		Take-off distance at temp. (°C)									
		-15		0		+15		+25		+35	
ft.	m.	ft.	m.	ft.	m.	ft.	m.	ft.	m.	ft.	m.
0	0	1660	505	1720	525	1790	545	1840	560	1890	575
1650	500	2040	620	2120	645	2180	665	2250	685	2300	700
3300	1000	2460	750	2560	780	2620	800	2690	820	2740	835
5000	1500	2940	895	3040	925	3140	955	3200	975	3260	995
6500	2000	3500	1070	3640	1110	3770	1150	3870	1180	3940	1200

Note. Taking off from a dry grass-field the distance figures above should be increased by 7 %.

LANDING DISTANCE FROM 50 FT. (15 M) HEIGHT

Flap position: DOWN

Approach speed 84 MPH (73 knots, 135 km/h) (IAS)

Airfield situa- tion above sea level		Landing distance at temp. (°C)									
		-15		0		+15		+25		+35	
ft.	m.	ft.	m.	ft.	m.	ft.	m.	ft.	m.	ft.	m.
	0	1650	500	1710	520	1780	542	1830	557	1880	573
1650	500	1760	522	1850	564	1870	570	1920	585	1970	602
3300	1000	1800	547	1960	588	1960	598	2020	616	2090	636
5000	1500	1890	577	2020	614	2080	632	2130	649	2200	668
6500	2000	2000	608	2100	640	2180	664	2230	680	2310	704

Note. Landing on a dry grass-field will give about the same distances.

NORMAL CLIMBING SPEED

Standard temperature

Flap position: UP

Gross weight 2570 lbs (1165 kg)

Altitude		Rate of climb				Climb speed (IAS)		
ft.	m.	plastic blades		metal blades		MPH	knots	km/h
		ft/min.	m/sec.	ft/min.	m/sec.			
	0	890	4.5	890	4.5	94	82	151
3300	1000	709	3.6	750	3.8	92	80	148
6500	2000	571	2.9	600	3.05	90	78	145
9900	3000	433	2.2	462	2.35	88	76	141

Note. Rate of climb is decreased appr. 4% when the cooling air shutters are extended to hole no. 4.

STALLING SPEED

Gross weight 2570 lbs (1165 kg)

Power	Flap. pos.	Stalling speed (IAS) at banking angle						
		0°	10°	20°	30°	40°	50°	60°
		MPH						
Idling	UP	72	72	75	78	81	88	101
Idling	TAKE-OFF	66	67	68	71	76	81	92
Idling	DOWN	62	62	63	65	70	76	87
		knots						
Idling	UP	63	63	65	68	70	77	88
Idling	TAKE-OFF	57	58	59	62	66	70	80
Idling	DOWN	54	54	55	56	61	66	76
		km/h						
Idling	UP	116	116	121	125	130	142	162
Idling	TAKE-OFF	106	108	109	114	122	130	148
Idling	DOWN	100	100	101	105	113	122	140

ENROUTE GLIDE

Gliding distance, engine inoperative, propeller wind-milling

Flap position: UP

Gliding speed:

93 MPH (81 knots, 150 km/h) (IAS) with landing gear and wing flaps up

84 MPH (73 knots, 135 km/h) (IAS) with landing gear and/or wing flaps down

Altitude, feet	3300	6500	9900	13100	16400	19700
Gliding distance, miles	7	14	21	27	34	41
Altitude, metres	1000	2000	3000	4000	5000	6000
Gliding distance, km	11	22	33	44	55	66

TAKE-OFF SAFETY SPEED

It is recommended that the airplane should be held down on ground until reaching the speeds below.

Gross weight lbs	2000	2100	2200	2325	2425	2570
Take-off safety speed MPH (IAS)	67	68	70	72	74	77
Gross weight lbs	2000	2100	2200	2325	2425	2570
Take-off safety speed knots (IAS)	58	59	61	63	64	67
Gross weight kgs	900	950	1000	1050	1100	1165
Take-off safety speed km/h (IAS)	108	109	112	115	118	123

Note. The take off safety speed is defined as the speed for the best angle of climb + 5 MPH (4.3 knots, 8 km/h), in accordance with CAR 3.84 (b).

LOADING DIRECTIONS

When distributing the load in the aircraft, the loading alternatives in the Loading chart can be used as examples.

The service empty weight is the same as basic empty weight provided the airplane is equipped according to the list of basic equipment. Any change in basic equipment or addition of extra equipment must be accounted for in weight and in arm when using the loading chart.

LOADING CHART (BRITISH UNITS)

Title	Examples of loading alternatives (weights in lbs)										Arm in sta	Notes	
	Normal flight					Aerobatics							
	A	B	C	D	E	F	G	F	G				
Service empty weight	278	278	278	278	278	278	278	278	278	278	159 ^x)	130.3	46.2 US gallons
Fuel	22	22	22	22	22	22	22	22	22	22	22	30.7	3.0 US gallons
Oil	170	170	170	170	170	170	170	170	170	198	198	96.3	
Pilot											198		
Passenger, front seat		170	170	170	170	170	170	170	170	170	198	96.3	
Passenger, rear seat			170	170	170	170	170	170	170	170	198	137.8	
Load in front pass. seat									220			96.3	Max. 220 lbs in
Load in rear pass. seat				104					142			137.8	each seat
Load in luggage hold			22	88								130.9	Max. 88 lbs
Gross weight													MAC = 53.7 inches
C.G. po- sition	94.2	94.3	97.5	97.3	96.8	94.2	92.5	94.2	94.2	94.2	92.5		Leading edge of MAC = sta 84.3
% MAC	18.5	18.8	24.7	24.4	23.3	18.5	15.4	18.5	18.5	18.5	15.4		

As to the C.G. range, see page 3

x) Reduced fuel quantity to keep max gross weight

LOADING CHART (METRIC UNITS)

Title	Examples of loading alternatives (weight in kgs)										Arm in mm	Notes	
	Normal flight						Aerobatics						
	A	B	C	D	E	F	G						
Service empty weight	126	126	126	126	126	126	126	126	126	126	72*	3310	175 litres
Fuel	10	10	10	10	10	10	10	10	10	10	10	780	11.4 litres
Oil	77	77	77	77	77	77	77	77	77	77	90	2445	
Pilot											90	2445	
Passenger, front seat		77	77	77	77	77	77	77	77	77	90	2445	
Passenger, rear seat											90	3500	
Load in front pass. seat									100			2445	Max 100 kgs in each seat
Load in rear pass. seat				47			64					3500	
Load in luggage hold			10	40								3325	Max 40 kgs
Gross weight													MAC = 1365 mm
C.G. po- sition	2392	2396	2477	2473	2458	2393	2350						Leading edge of MAC = sta 2140
	18.5	18.8	24.7	24.4	23.3	18.5	15.4						

As to the C. G. range, see page 3

x) Reduced fuel quantity to keep max gross weight

BASIC EMPTY WEIGHT AND CG POSITION

The basic empty weight includes the equipment specified in the list of basic equipment

Site	Date	Basic empty weight	CG position arm	Sign.

