SUPPLEMENT S07
TO THE AIRPLANE FLIGHT MANUAL
DA 42 with GFC 700

TAE 125-02-114 ENGINE

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This Supplement is approved in accordance with 14 CFR 21.29 for U.S. registered aircraft, and is approved by the Federal Aviation Administration. This document is applicable to the following Airplane Model: DA 42 with GFC 700.

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0.2 RECORD OF REVISIONS

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1. GENERAL

1.1 INTRODUCTION

This Supplement to the Airplane Flight Manual has been prepared in order to provide all necessary information for the safe and efficient operation of the airplane with TAE 125-02-114 engines installed. Chapter 5 of this Supplement supersedes Chapter 5 of the existing AFM completely in order to provide compact performance information for operation with TAE 125-02-114 engines.

This Supplement to the Airplane Flight Manual must be used at all times, if the TAE 125-02-114 engines are installed.

1.9 SOURCE DOCUMENTATION

1.9.1 ENGINE

Documents: TAE 125-02-114 Operation and Maintenance Manual (latest revision)

2. OPERATING LIMITATIONS

2.2 AIRSPEED

	Airspeed		IAS	Remarks
v_A	Maneuvering speed	above 1542 kg (3400 lb)	123	Do not make full or abrupt control surface movement above this speed.
		up to 1542 kg (3400 lb)	117	
v_{FE}	Max. flaps extended speed	LDG	113	Do not exceed these speeds with the given flap setting.
		APP	133	
v_{LO}	Max. landing gear operating speed	Extension v_{LOE}	188	Do not operate the landing gear above this speed.
		Retraction v_{LOR}	152	
v_{LE}	Max. landing gear extended speed		188	Do not exceed this speed with the landing gear extended.
v_{MCA}	Minimum control speed airborne	APP	69	With one engine inoperative keep airspeed above this limit.
		UP	73	
v_{NO}	Max. structural cruising speed		151	Do not exceed this speed except in smooth air, and then only with caution.
v_{NE}	Never exceed speed in smooth air		188	Do not exceed this speed in any operation.

2.3 AIRSPEED INDICATOR MARKINGS

Marking	KIAS	Significance
White arc	62-113	Operating range with flaps fully extended.
Green arc	69-151	Normal operating range.
Yellow arc	151-188	'Caution range' - "Only in smooth air".
Blue radial	88	Best rate of climb speed, single engine.
Red radial	73	Minimum control speed, single engine.
Red radial	188	Maximum speed for all operations - v_{NE}.

2.4 POWER PLANT LIMITATIONS

c) Engine designation : TAE 125-02-114

(P/N see Equipment List in Chapter 6)

e) Engine power

Max. take-off power : 114 kW (155 DIN-hp) at 2300 RPM (100 % load)

Max. continuous power : 114 kW (155 DIN-hp) at 2300 RPM (100 % load)

2.15 LIMITATION PLACARDS

Limitations for GFC 700 Autopilot System:

Autopilot / Yaw Damper DISC during take-off and landing.

Do not use AP during single engine operation.

Maximum speed for autopilot operation is 140 KIAS.

Minimum speed for autopilot operation is 90 KIAS.

Minimum altitude for autopilot operation:

Cruise, Climb, Descent and Maneuvering:	800 feet AGL
Approach:	200 feet AGL
Departure:	200 feet AGL

2.16 OTHER LIMITATIONS

AUTO PILOT LIMITATIONS

NOTE

If the TAE 125-02-114 engines are installed, the Autopilot limitations of Supplement S07 apply.

2.16.6 GARMIN G1000 AVIONICS SYSTEM

2. The G1000 must utilize the software Garmin P/N 010-00370-22, or later approved software and the secondary configuration loader card P/N010-12074-05 in accordance with the mandatory service bulletin DAI MSB42-008, latest version.

3. EMERGENCY PROCEDURES

3.1 INTRODUCTION

3.1.2 CERTAIN AIRSPEEDS IN EMERGENCIES

Symbol	Event		Airspeed	
			up to 1700 kg (3748 lb)	above 1700 kg (3748 lb)
V_{MCA}	One engine inoperative minimum control speed (air) v_{mCA}	UP	73 KIAS	73 KIAS
		APP	69 KIAS	69 KIAS
V_{YSE}	One engine inoperative speed for best rate of climb v_{YSE}		88 KIAS	88 KIAS
V_{REF}	Reference landing approach speed	UP	87 KIAS	88 KIAS
		APP	83 KIAS	83 KIAS
		LDG	79 KIAS	79 KIAS

3.5 ONE ENGINE INOPERATIVE PROCEDURES

WARNING

In certain combinations of airplane weight, configuration, ambient conditions, speed and pilot skill, negative climb performance may result. Refer to Chapter 5, PERFORMANCE for one engine inoperative performance data.

In any event the sudden application of power during one-engine inoperative operation makes the control of the airplane more difficult.

3.5.1 DETECTING THE INOPERATIVE ENGINE

NOTE

One engine inoperative means an asymmetric loss of thrust, resulting in uncommanded yaw and roll in direction of the so-called "dead" engine (with coordinated controls). To handle this situation it is vital to maintain directional control by mainly rudder and additional aileron input. The following mnemonic can help to identify the failed engine:

"Dead foot - dead engine"

This means that, once directional control is re-established, the pilot can feel the control force on the foot pushing the rudder-pedal on the side of the operative engine, while the foot on the side of the failed engine feels no force. Further, the engine instruments can help to analyze the situation.

3.5.2 ENGINE TROUBLESHOOTING

WARNING

Control over the flight attitude has priority over attempts to solve the current problem ("first fly the aircraft").

NOTE

With respect to handling and performance, the left-hand engine (pilots view) is considered the "critical" engine.

Depending on the situation the following attempts can be made to restore engine power prior to securing the engine:

CAUTION

Once the engine has been shut down for longer than 30 seconds, it can only be restarted below 8000 ft pressure altitude. Proceed in accordance with 3.5.4 - UNFEATHERING & RESTARTING THE ENGINE IN FLIGHT.

1. POWER lever . . . . . IDLE

NOTE

If the loss of power was due to unintentional setting of the POWER lever, you may adjust the friction lock and continue your flight.

2. If in icing conditions . . . . . alternate air ON
3. Fuel quantity . . . . . check

CONTINUED

NOTE

In case of low fuel quantity in the affected engine's fuel tank you may feed it from the other engine's fuel tank by setting the affected engine's FUEL SELECTOR to CROSSFEED.

4. FUEL SELECTOR. . . . . check ON / CROSSFEED if required

NOTE

If the loss of power was due to unintentional setting of the FUEL SELECTOR to the OFF position you may continue your flight but have the proper function of the restrainer locks checked prior to next flight.

5. ECU SWAP. . . . . ECU B

NOTE

If the swap to ECU B has restored engine power land as soon as possible. If selecting ECU B does not solve the problem, switch back to AUTOMATIC in order to maintain the engine control system redundancy.

6. Circuit breakers. . . . . check / reset if necessary

NOTE

If resetting the circuit breakers has restored engine power land as soon as possible.

If the engine power could not be restored by following the procedure of this section prepare for 3.5.6 - ENGINE FAILURES IN FLIGHT and land as soon as possible.

END OF CHECKLIST

3.5.3 ENGINE SECURING (FEATHERING) PROCEDURE

Depending on the situation attempts can be made to restore engine power prior to securing the engine (see Section 3.5.2 - ENGINE TROUBLESHOOTING).

Shut down and feathering of the affected engine:

1. Inoperative engine . . . . . identify & verify
2. ENGINE MASTER inoperative engine . . . . . OFF

CAUTION

Do not shut down an engine with the FUEL SELECTOR valve. The high pressure fuel pump can otherwise be damaged.

Securing the feathered engine:

3. Alternator inoperative engine . . . . . OFF
4. FUEL SELECTOR inoperative engine . . . . . OFF

NOTE

The remaining fuel in the tank of the failed engine can be used for the remaining engine, to extend range and maintain lateral balance, by setting its FUEL SELECTOR in the CROSSFEED position.

If one of the POWER levers is set to low settings the landing gear warning horn is activated. Set the POWER lever of the secured engine forward as required to mute the warning horn.

END OF CHECKLIST

3.5.4 UNFEATHERING & RESTARTING THE ENGINE IN FLIGHT

WARNING

Do not attempt to restart the feathered engine when the reason of the engine failure cannot be identified since the un-feathered propeller of an inoperative engine might not be able to be feathered again.

WARNING

An unfeathered propeller causes increased drag and reduces/increases climb/sink rate up to 200 ft/min.

NOTE

Restarting the engine in flight is possible at altitudes below 8000 ft pressure altitude.

Above 8000 ft pressure altitude restart in flight has not been demonstrated.

If the reason of the engine failure can be identified as the result of an improper handling by the pilot and there is no indication of malfunction or engine fire a restart may be attempted. Refer to 3.5.2 - ENGINE TROUBLE SHOOTING to check for possible causes.

1. Airspeed . . . . . below 90 KIAS
2. POWER lever affected engine . . . . . IDLE
3. FUEL SELECTOR affected engine . . . . . check ON
4. ALTERNATE AIR. . . . . as required
5. Alternator . . . . . ON
6. ENGINE MASTER affected engine . . . . . ON

CONTINUED

7. Starter affected engine . . . . . engage until propeller speed reaches 500 RPM/ if propeller does not start windmilling by itself

CAUTION

Disengaging the starter below 500 RPM propeller speed might damage the gearbox.

CAUTION

Do not engage the starter if the propeller is windmilling! This might damage the starter.

CAUTION

After the engine has started, the power lever should be set to a moderate power setting, until engine temperatures have reached the green range.

8. Circuit breakers . . . . . check

Restarting the engine by windmilling:

9. Airspeed . . . . . 125 KIAS to 145 KIAS
10. POWER lever affected engine . . . . . IDLE
11. FUEL SELECTOR affected engine. . . . . check ON
12. ALTERNATE AIR . . . . . as required
13. Alternator . . . . . ON
14. ENGINE MASTER affected engine . . . . . ON

CONTINUED

CAUTION

After the engine has started, the power lever should be set to a moderate power setting, until engine temperatures have reached the green range.

15. Circuit breakers . . . . . check

Feathering the engine, if engine does not start:

WARNING

One attempt to feather the engine results in a loss of altitude of up to 800 ft. Do not attempt to feather the engine if the altitude is insufficient to execute the procedure.

CAUTION

If the propeller does not feather after the first attempt, do not carry out further attempts to feather the propeller to avoid further loss of altitude.

NOTE

To feather the propeller the propeller RPM must be above 1300 RPM. Below 1300 RPM the start locks will not disengage and the propeller will keep wind-milling.

To avoid unsuccessful attempts, the procedure instructs to feather the propeller at 1800 RPM.

Increase the airspeed swiftly to minimize altitude loss. In case of shaking rotation, continue to accelerate the aircraft until 1800 RPM is reached.

CONTINUED

16. Airspeed . . . . . v_{YSE} (88 KIAS)
17. POWER Lever affected engine 100%
18. Engine Master Switch affected engine . . . . . check ON
19. Airspeed . . . . . increase to propeller wind-milling speed of above 1800 RPM
20. Engine Master Switch affected engine . . . . . OFF
21. Airspeed . . . . . reduce to v_{YSE} (88 KIAS)
22. Propeller . . . . . check feathered
23. Alternator inoperative engine . . . . . OFF
24. FUEL SELECTOR Inoperative Engine . . . . . OFF
25. Proceed with 3.5.9 - FLIGHT WITH ONE ENGINE INOPERATIVE.

NOTE

The remaining fuel in the tank of the failed engine can be used for the remaining engine, to extend range and maintain lateral balance by setting the fuel selector of the remaining engine to the CROSSFEED position. If one of the power levers is set to low settings the landing gear warning horn is activated. Set the power lever of the secured engine forward as required to mute the warning horn.

END OF CHECKLIST

3.5.5 ENGINE FAILURE DURING TAKE-OFF

(a) Engine Failure During Ground Roll

- Abort take-off.

1. POWER lever . . . . . IDLE / BOTH
2. Rudder . . . . . maintain directional control
3. Brakes . . . . . as required

CAUTION

If sufficient time is remaining, the risk of fire in the event of a collision with obstacles can be reduced as follows:

4. ENGINE MASTER . . . . . both OFF
5. FUEL SELECTOR. . . . . both OFF
6. ELECT. MASTER . . . . . OFF

END OF CHECKLIST

(b) Engine Failure after Lift-Off

If landing gear is still extended and the remaining runway / surface is adequate:

- Abort the take-off & land straight ahead, turning to avoid obstacles.

If the remaining runway / surface is inadequate:

- Decide whether to abort or to continue the take-off.

Continued take-off:

WARNING

A continued take-off is not recommended if the steady rate of climb according to Section 5.3.9 - ONE ENGINE INOPERATIVE CLIMB PERFORMANCE is less than 3.3 %. Under certain combinations of ambient conditions, such as turbulence, crosswinds and wind shear as well as pilot skill the resulting climb performance may nevertheless be insufficient to continue the take-off successfully. Therefore a continued take-off with a failed engine has to be avoided if at all possible.

1. POWER lever . . . . . MAX
2. Rudder . . . . . maintain directional control
3. Airspeed . . . . . v_{YSE} (88 KIAS) / as required
4. Landing gear. . . . . UP to achieve a positive ROC
5. FLAPS . . . . . check UP
6. Inoperative Engine . . . . . secure according to 3.5.3 - ENGINE SECURING (FEATHERING) PROCEDURE

CONTINUED

Continue according to Section 3.5.9 - FLIGHT WITH ONE ENGINE INOPERATIVE and land as soon as possible according to 3.5.7 - LANDING WITH ONE ENGINE INOPERATIVE.

If the situation allows, you may climb to a safe altitude for troubleshooting (3.5.2 - ENGINE TROUBLESHOOTING) in order to try to restore engine power.

END OF CHECKLIST

3.5.6 ENGINE FAILURES IN FLIGHT

(a) Engine Failure During Initial Climb at Airspeeds Below v_{MCA}

WARNING

As the climb is a flight condition which is associated with high power settings, airspeeds lower than v_{MCA} (69 KIAS Flaps APP or 73 KIAS Flaps UP) should be avoided as a sudden engine failure can lead to loss of control. In this case it is very important to reduce the asymmetry in thrust to regain directional control.

1. Rudder . . . . . apply for directional control
2. POWER levers . . . . . retard as required to maintain directional control
3. Airspeed . . . . . v_{YSE} (88 KIAS) / above v_{MCA} (69 KIAS Flaps APP or 73 KIAS Flaps UP) as required
4. Operative engine . . . . . increase power as required if directional control has been re-established

Establish minimum / zero sideslip condition. (approx. half ball towards good engine; 3° to 5° bank)

5. Inoperative engine . . . . . secure according to 3.5.3 - ENGINE SECURING (FEATHERING) PROCEDURE

Continue according to Section 3.5.9 - FLIGHT WITH ONE ENGINE INOPERATIVE and land as soon as possible according to Section 3.5.7 - LANDING WITH ONE ENGINE INOPERATIVE.

CONTINUED

If the situation allows, you may climb to a safe altitude for troubleshooting (3.5.2 - ENGINE TROUBLESHOOTING) in order to try to restore engine power.

END OF CHECKLIST

b) Engine Failure During Initial Climb at Airspeeds Above v_{MCA}

1.	Rudder	maintain directional control
3.	Airspeed	v_{YSE} (88 KIAS) / above v_{MCA} (69 KIAS Flaps APP or 73 KIAS Flaps UP) as required
3.	Operative engine	increase power as required if directional control has been established

Establish minimum / zero sideslip condition. (approx. half ball towards good engine; 3° to 5° bank)

4.	Inoperative engine	secure according to 3.5.3 - ENGINE SECURING (FEATHERING) PROCEDURE

Continue according to Section 3.5.9 - FLIGHT WITH ONE ENGINE INOPERATIVE and land as soon as possible according to Section 3.5.7 - LANDING WITH ONE ENGINE INOPERATIVE.

If the situation allows, you may climb to a safe altitude for troubleshooting (3.5.2 - ENGINE TROUBLESHOOTING) in order to try to restore engine power.

END OF CHECKLIST

(c) Engine Failure During Flight

1.	Rudder	maintain directional control
2.	Airspeed	as required / above v_{MCA} (69 KIAS Flaps APP or 73 KIAS Flaps UP)
3.	Operative engine	increase power as required if directional control has been established

Establish minimum / zero sideslip condition. (approx. half ball towards good engine; 3° to 5° bank)

4.	Inoperative engine	secure according to 3.5.3 - ENGINE SECURING (FEATHERING) PROCEDURE

Continue according to Section 3.5.9 - FLIGHT WITH ONE ENGINE INOPERATIVE and land as soon as possible according to Section 3.5.7 - LANDING WITH ONE ENGINE INOPERATIVE.

If the situation allows, you may climb to a safe altitude for troubleshooting (3.5.2 - ENGINE TROUBLESHOOTING) in order to try to restore engine power.

END OF CHECKLIST

3.5.7 LANDING WITH ONE ENGINE INOPERATIVE

Preparation:

CAUTION

For emergency landing the adjustable backrests (if installed) must be fixed in the upright position.

1.	Adjustable backrests (if installed)	adjust to the upright position described by a placard on the roll-over bar and verify proper fixation
2.	Safety harnesses	check fastened & tightened
3.	Landing light	as required
4.	Gear warning horn	check function

Operative engine:

5.	FUEL SELECTOR.	check ON / CROSSFEED as required

Inoperative engine:

6.	Engine	check secured (feathered) according to 3.5.3 - ENGINE SECURING & FEATHERING PROCEDURE

Not before being certain of "making the field“:

7.	Airspeed	reduce to operate landing gear
8.	Landing gear	DOWN, check 3 green
9.	Trim	as required

CONTINUED

10. Airspeed . . . . . reduce as required
11. FLAPS . . . . . as required
12. Final approach speed
    at 1700 kg (3748 lb) . . . . . 87 KIAS (v_{REF}/FLAPS UP)
    83 KIAS (v_{REF}/FLAPS APP)
    79 KIAS (v_{REF}/FLAPS LDG)
    at 1785 kg (3935 lb) . . . . . 88 KIAS (v_{REF}/FLAPS UP)
    83 KIAS (v_{REF}/FLAPS APP)
    82 KIAS (v_{REF}/FLAPS LDG)

WARNING

One-engine inoperative approaches for landing with flap settings of more than flaps UP are not recommended unless a safe landing is assured („Making the field“). Higher flap settings increase the loss of altitude during the transition to a one engine inoperative go-around / balked landing.

13. POWER lever . . . . . as required
14. Trim . . . . . as required / directional trim to neutral

NOTE

Higher approach speeds result in a significantly longer landing distance during flare.

CAUTION

In conditions such as (e.g.) strong wind, danger of wind shear or turbulence a higher approach speed should be selected.

- Perform normal touchdown and deceleration on ground.

END OF CHECKLIST

3.5.8 GO-AROUND / BALKED LANDING WITH ONE ENGINE INOPERATIVE

CAUTION

The go-around / balked landing is not recommended to be initiated below a minimum of 800 ft above ground.

For performance data with one engine inoperative and flaps and gear UP refer to 5.3.9 ONE ENGINE INOPERATIVE CLIMB PERFORMANCE.

Under certain combinations of ambient conditions, such as turbulence, cross wind and windshear, as well as pilot skill, the resulting climb performance may nevertheless be insufficient for a successful go-around / balked landing.

1. POWER lever . . . . . MAX / as required
2. Rudder . . . . . maintain directional control
3. Airspeed . . . . . v_{YSE} = 88 KIAS / as required
4. Landing Gear . . . . . UP / retract
5. FLAPS. . . . . UP

- Establish minimum sideslip and manoeuver for a new attempt to land. Repeat from step 1 of this section.

CONTINUED

If a positive rate of climb cannot be established:

- Land so as to keep clear of obstacles.

If time allows the following steps can reduce the risk of fire in an event of collision with obstacles after touchdown:

6. ENGINE MASTER . . . . . both OFF
7. FUEL SELECTOR . . . . . both OFF
8. FLAPS . . . . . APP or LDG, as required

NOTE

If landing is performed off airfield, depending on the surface condition it may be beneficial to land with the gear UP. Note that the energy absorbing function of the landing gear is lost in such cases.

NOTE

Extending the gear and extending the flaps to LDG will increase drag and incur a high sink rate. Only when the landing area can be reached safely, landing with flaps LDG is advisable.

9. Approach speed:
   at 1700 kg (3748 lb) . . . . . 83 KIAS (v_{REF}/FLAPS APP)
   79 KIAS (v_{REF}/FLAPS LDG)
   at 1785 kg (3935 lb) . . . . . 83 KIAS (v_{REF}/FLAPS APP)
   82 KIAS (v_{REF}/FLAPS LDG)

CONTINUED

If landing with landing gear extended:

10. LANDING GEAR . . . . . DOWN, check 3 green
11. ELECT. MASTER . . . . . OFF
12. Touch down. . . . . lowest practical speed

If landing with landing gear retracted:

10. LANDING GEAR . . . . . UP
11. Touch down. . . . . lowest practical speed

Immediately after touchdown:

12. ELECT. MASTER . . . . . OFF

NOTE

If the ELECT. MASTER is switched OFF before touchdown the landing gear will extend slowly.

END OF CHECKLIST

3.5.9 FLIGHT WITH ONE ENGINE INOPERATIVE

CAUTION

Even if a positive flight performance can be established with one engine inoperative, land as soon as practicable at the next suitable airfield / airport.

1.	Airspeed	above v_{MCA} = 69 KIAS Flaps APP or 73 KIAS Flaps UP to maintain directional control
2.	Remaining engine	monitor engine instruments continuously
3.	Fuel quantity	monitor continuously
4.	FUEL SELECTOR	remaining engine / set CROSSFEED or ON so as to keep fuel quantity laterally balanced

NOTE

If the FUEL SELECTOR is set on CROSSFEED, the engine will be supplied with fuel from the main tank on the opposite side.

This will extend range and helps to keep the wings laterally balanced (see 2.14 - FUEL).

Land as soon as possible according to Section 3.5.7 - LANDING WITH ONE ENGINE INOPERATIVE.

If the situation allows, you may climb to a safe altitude for troubleshooting (3.5.2 - ENGINE TROUBLESHOOTING) in order to try to restore engine power.

END OF CHECKLIST

4A NORMAL OPERATING PROCEDURES

4A.2 AIRSPEEDS FOR NORMAL OPERATING PROCEDURES

Symbol	Event	FLAPS	Airspeed	
			up to 1700 kg (3748 lb)	above 1700 kg[1)] (3748 lb)
v_R	Airspeed for rotation (take-off run)	UP	min. 77 KIAS	min. 77 KIAS
		APP	min. 73 KIAS	min. 73 KIAS
v_{50}	Airspeed for initial climb (take-off)	UP	min. 81 KIAS	min. 82 KIAS
		APP	77 KIAS	77 KIAS
v_Y	Airspeed for best rate-of-climb [2)]		81 KIAS	82 KIAS
v_{climb}	Airspeed for cruise climb		85 KIAS	86 KIAS
v_{REF}	Reference landing approach speed	UP	87 KIAS	88 KIAS
		APP	83 KIAS	83 KIAS
	Final approach speed	LDG	79 KIAS	82 KIAS
v_{NO}	Max. structural cruising speed Do not exceed this speed except in smooth air, and then only with caution.		151 KIAS	151 KIAS

1) See NOTE below

2) Also the speed for best angle of climb (v_x). v_x is usually less than v_y. For the DA 42 however, the actual value of v_x would be below the minimum safe speed. The minimum airspeed for best angle of climb was therefore raised to the value of v_y.

4A.4 FLIGHT CHARACTERISTICS

The DA 42 is to be flown with “the feet on the pedals”, meaning that coordinated flight in all phases and configurations shall be supported by dedicated use of the rudder ans ailerons together.

The airplane will recover from sideslip in all conditions if trimmed. At aft CG-locations, with full power applied, the airplane will easily recover from sideslip if the trim is set to neutral (normal procedure), otherwise it may require corrective action with a moderate amount of rudder input.

4A.6 CHECKLISTS FOR NORMAL OPERATING PROCEDURES

4A.6.1 PRE-FLIGHT INSPECTION

5. Empennage:

a) Stabilizers and control surfaces,
elevator tips . . . . . visual inspection
b) Hinges . . . . . visual inspection
c) Elevator trim tab . . . . . visual inspection, check safetying
d) Rudder trim tab . . . . . visual inspection, check safetying
e) Tie-down . . . . . check, clear
f) Tail skid and lower fin . . . . . visual inspection
g) Static dischargers . . . . . visual inspection
h) Rudder gap seal LH & RH . . . . . visual inspection
i) Vortex generators LH & RH . . . . . undamaged, 10 pcs / side, clean

4A.6.7 TAKE-OFF

Standard Procedure (Take-Off with Flaps UP)

1. Transponder . . . . . as required
2. POWER lever . . . . . MAX

NOTE

The proper and symmetric performance of the engines at MAX should be checked early during the take-off run, so that the take-off can be aborted if necessary.

3. Elevator . . . . . neutral
4. Rudder. . . . . maintain direction

NOTE

In strong crosswinds steering can be augmented by use of the toe brakes. It should be noted, however, that this method increases the take-off roll, and should not generally be used.

5. Nose wheel lift-off . . . . . v_R (minimum 77 KIAS)
6. Airspeed for initial climb:
   - up to 1700 kg (3748 lb). . . . . v_{50} (Minimum 81 KIAS), recommended V_{YSE} (88 KIAS) when clear of obstacles
   - above 1700 kg (3748 lb). . . . . v_{50} (Minimum 82 KIAS), recommended V_{YSE} (88 KIAS) when clear of obstacles

CONTINUED

When safe climb is established:

7. Landing gear . . . . . apply brakes; UP, check unsafe light off

NOTE

To avoid damage and excessive wear of the main landing gear wheels, firmly apply brakes before selecting gear up.

END OF CHECKLIST

Short Field Procedure (Take-Off with Flaps APP)

1. Flaps . . . . . APP
2. Transponder. . . . . as required
3. POWER lever. . . . . MAX

NOTE

The proper and symmetric performance of the engines at MAX should be checked early during the take-off run, so that the take-off can be aborted if necessary.

4. Elevator . . . . . neutral
5. Rudder . . . . . maintain direction

CONTINUED

NOTE

In strong crosswinds steering can be augmented by use of the toe brakes. It should be noted, however, that this method increases the take-off roll, and should not generally be used.

6. Nose wheel lift-off . . . . . v_R (73 KIAS)
7. Airspeed for initial climb. . . . . v_{50} (Minimum 77 KIAS), recommended V_{YSE} (88 KIAS) when clear of obstacles

When safe climb is established:

8. Landing gear . . . . . apply brakes; UP, check unsafe light off

NOTE

To avoid damage and excessive wear of the main landing gear wheels, firmly apply brakes before selecting gear up.

END OF CHECKLIST

4A.6.9 CLIMB

Initial Climb Check

1. Landing light. . . . . OFF / as required
2. Landing gear . . . . . check UP
3. FLAPS . . . . . check UP
4. Airspeed:
   - up to 1700 kg (3748 lb) . . . . . 81 KIAS (best rate-of-climb)
     85 KIAS / as required for en route (cruise) climb
   - above 1700 kg (3748 lb) . . . . . 82 KIAS (best rate-of-climb)
     86 KIAS / as required for en-route (cruise) climb
5. POWER lever. . . . . MAX
6. Trim . . . . . as required (ball centered)
7. Annunciations/Engine/System Page . . . . . monitor

CAUTION

If the oil temperature and/or coolant temperature reaches the yellow range during climb, flight should be continued with the airspeed increased by 10 kts and power reduced by 10 % (reduced climb rate) for better engine cooling.

END OF CHECKLIST

4A.6.12 APPROACH & LANDING

Approach:

CAUTION

For landing the adjustable backrests (if installed) must be fixed in the upright position.

1. Adjustable backrests (if installed) . . . . . adjust to the upright position described by a placard on the roll-over bar and verify proper fixation

NOTE

If the landing mass exceeds 1700 kg (3748 lb) and OÄM 42-195 is not carried out, the landing constitutes an abnormal operating procedure. Refer to Section 4B.11 - LANDING WITH MASS ABOVE MAXIMUM LANDING MASS.

2. Safety harnesses . . . . . check fastened and tightened
3. Controls . . . . . no interference by foreign objects
4. Landing light . . . . . as required
5. Gear warning horn . . . . . check function
6. FUEL SELECTOR . . . . . check ON
7. Landing gear . . . . . DOWN, check 3 green
8. Parking brake . . . . . check released
9. Trim . . . . . as required, directional trim neutral

CONTINUED

Before landing:

10. Airspeed
    - Up to 1700 kg (3748 lb) . . . . . v_{REF} (min. 83 KIAS / FLAPS APP)
    - Above 1700 kg (3748 lb) . . . . . v_{REF} (min. 83 KIAS / FLAPS APP)
    - Up to 1700 kg (3748 lb) . . . . . v_{REF} (min. 87 KIAS / FLAPS UP)
    - Above 1700 kg (3748 lb) . . . . . v_{REF} (min. 88 KIAS / FLAPS UP)

11. FLAPS . . . . . as required
12. POWER lever. . . . . as required
13. Trim . . . . . as required, directional trim neutral
14. Final approach speed
    - Up to 1700 kg (3748 lb) . . . . . v_{REF} (min. 79 KIAS / FLAPS LDG)
    - Above 1700 kg (3748 lb) . . . . . v_{REF} (min. 82 KIAS / FLAPS LDG)

NOTE

Higher approach speeds result in a significantly longer landing distance during flare.

CAUTION

In conditions such as (e.g.) strong wind, danger of wind shear or turbulence a higher approach speed should be selected.

END OF CHECKLIST

4A.6.13 GO AROUND

The existing checklist is amended to read:

1. POWER lever . . . . . MAX
2. FLAPS . . . . . position APP
3. Airspeed . . . . . min. v_{YSE} (88 KIAS)

when a positive rate of climb is established:

4. Landing gear . . . . . UP, check unsafe light off
5. FLAPS . . . . . retract, position UP

END OF CHECKLIST

4B. ABNORMAL OPERATING PROCEDURES

4B.4.11 STICK LIMIT

STICK LIMIT	Control stick limiting system (variable elevator stop) has failed.

The variable elevator backstop is activated depending on the position of the POWER levers. The system has two failure modes which can be identified as follows:

(a) Both POWER Levers Are in a Position for a Power Setting of More than Approximately 20 % LOAD

CAUTION

The variable elevator backstop is inoperative. In case of stalling with "power-on" the handling qualities and stall-characteristics are degraded significantly.
Do not stall the airplane in any configuration.

(b) At Least One POWER Lever Is in a Position for a Power Setting of Less than Approximately 20 % LOAD

CAUTION

The variable elevator backstop is active all the time, reducing the maximum elevator "pull"-deflection. This results in reduced elevator capacity. In this case it is important not to reduce airspeed below required minimum v_{REF} during the approach for landing, especially at loading conditions with forward locations of the center of gravity.

up to 1700 kg (3748 lb) . . . . . v_{REF} = 79 KIAS
above 1700 kg (3748 lb) . . . . . v_{REF} = 82 KIAS

END OF CHECKLIST

4B.11 LANDING WITH MASS ABOVE MAXIMUM LANDING MASS

NOTE

Refer to Section 4A.6.12 - APPROACH & LANDING if OÄM 42-195 is carried out and for landings with a mass up to 1700 kg (3748 lb).

Perform landing approach according to Section 4A.6.12 - APPROACH & LANDING, but maintain an increased airspeed during final landing approach.

1. Approach speed . . . . . min. V_{REF} (83 KIAS / FLAPS APP)
   min. V_{REF} (88 KIAS / FLAPS UP)
2. Final approach speed . . . . . min. V_{REF} (82 KIAS / FLAPS LDG)

3. Minimum speed on go-around . . . . . v_{YSE} (88 KIAS)

END OF CHECKLIST

5. PERFORMANCE

5.1 INTRODUCTION

The performance tables and diagrams on the following pages are presented so that, on the one hand, you can see what performance you can expect from your airplane, while on the other they allow comprehensive and sufficiently accurate flight planning. The values in the tables and the diagrams were obtained in the framework of the flight trials using an airplane and power-plant in good condition, and corrected to the conditions of the International Standard Atmosphere (ISA = 15 °C / 59 °F and 1013.25 hPa / 29.92 inHg at sea level).

The performance diagrams do not take into account variations in pilot experience or a poorly maintained airplane. The performances given can be attained if the procedures quoted in this manual are applied, and the airplane has been well maintained.

5.2 USE OF PERFORMANCE TABLES AND DIAGRAMS

In order to illustrate the influence of a number of different variables, the performance data is reproduced in the form of tables or diagrams. These contain sufficiently detailed information so that conservative values can be selected and used for the determination of adequate performance data for the planned flight.

For a conversion of units see Chapter 1.6 - UNITS OF MEASUREMENT.

For temperatures, altitudes and weights between those provided, use a linear interpolation between the neighboring values.

For operation in outside air temperature lower than provided in these tables, use data for lowest temperature shown.

Use extreme caution for operation at outside air temperature higher than provided in the tables (areas are indicated with a diagonal line).

5.3 PERFORMANCE TABLES AND DIAGRAMS

5.3.1 AIRSPEED CALIBRATION

NOTE

The position of the landing gear (extended/retracted) has no significant influence on the airspeed indicator system.

Airspeed Indicator Calibration			
Indicated Airspeed [KIAS]	Calibrated Airspeed [KCAS] at Various Flap Settings		
	UP	APP	LDG
75	not applicable		73
80	79	80	78
85	85	85	82
90	90	90	87
95	96	95	92
100	101	101	97
105	106	106	101
110	112	111	106
115	117	116	111
120	122	121	
125	128	126	
130	133	132	
135	138	137	
140	143	not applicable	
150	154		
160	164		
170	174		
180	184		
188	192		

5.3.2 FUEL FLOW

CAUTION

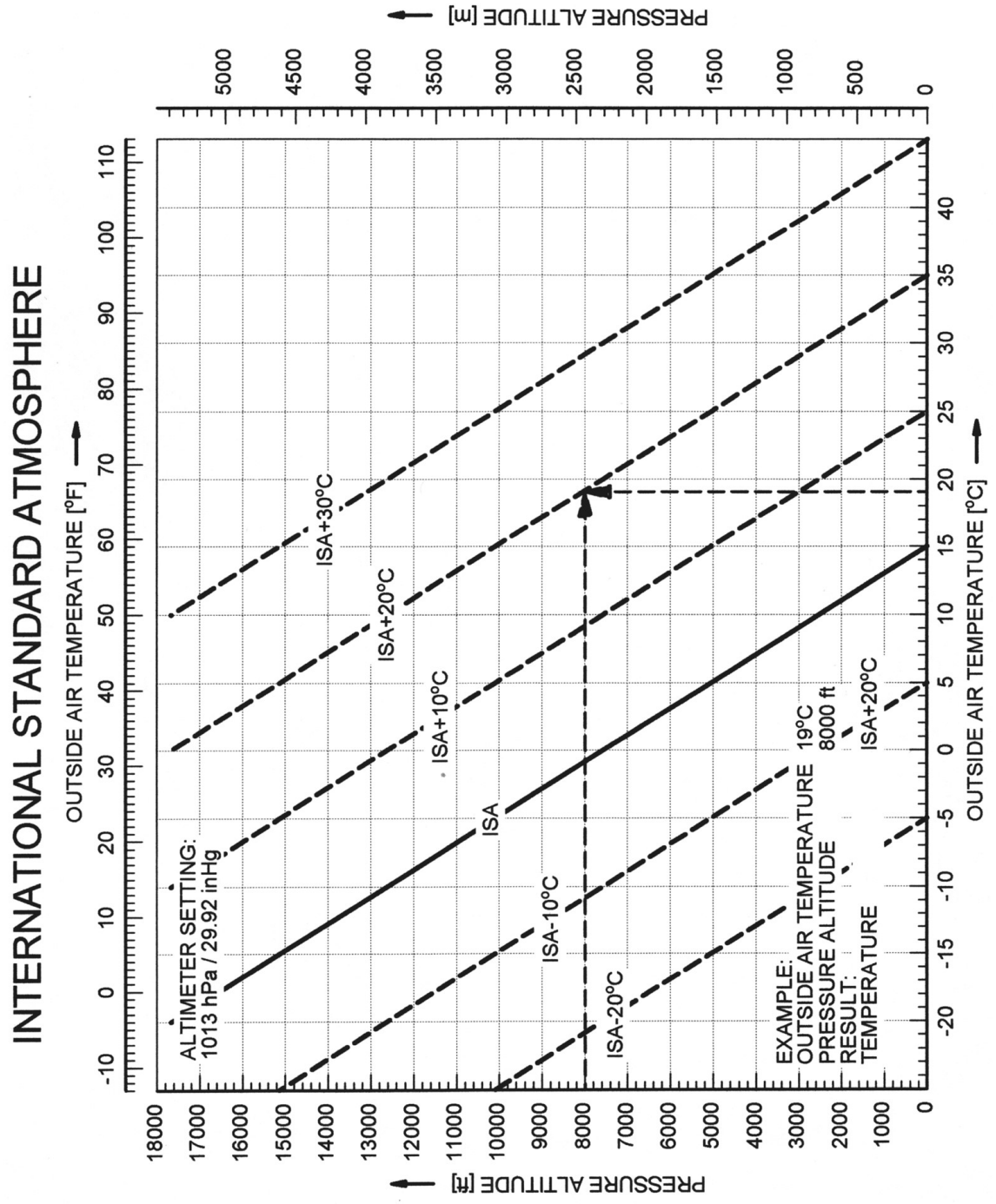
The table shows the fuel flow per hour for one engine.

NOTE

The fuel calculations on the FUEL CALC portion of the G1000 MFD do not use the airplane's fuel quantity indicators. The values shown are numbers which are calculated from the last fuel quantity update done by the pilot and actual fuel flow data. Therefore, the endurance and range data is for information only, and must not be used for flight planning.

Fuel Flow		
Power Setting [%]	**Fuel Flow [US gal / h]**	**Fuel Flow [Liter / h]**
30	2.3	8.5
35	2.7	10.5
40	3.2	12.0
45	3.6	13.5
50	4.0	15.5
55	4.5	17.0
60	4.9	18.5
65	5.4	20.5
70	5.8	22.0
75	6.3	24.0
80	6.8	26.0
85	7.3	27.5
90	7.8	29.5
95	8.3	31.5
100	8.9	33.5

5.3.3 INTERNATIONAL STANDARD ATMOSPHERE


INTERNATIONAL STANDARD ATMOSPHERE
OUTSIDE AIR TEMPERATURE [°F]
OUTSIDE AIR TEMPERATURE [°C]
PRESSURE ALTITUDE [ft]
PRESSURE ALTITUDE [m]
ALTIMETER SETTING:
1013 hPa / 29.92 inHg
ISA+30°C
ISA+20°C
ISA+10°C
ISA
ISA-10°C
ISA-20°C
EXAMPLE:
OUTSIDE AIR TEMPERATURE 19°C
PRESSURE ALTITUDE 8000 ft
RESULT:
TEMPERATURE ISA+20°C

5.3.4 STALLING SPEEDS

CAUTION

The calculated stalling speeds may be higher than the maximum approved / limiting flap-extended and / or maneuvering airspeeds.

Stalling Speeds at Various Flight Masses

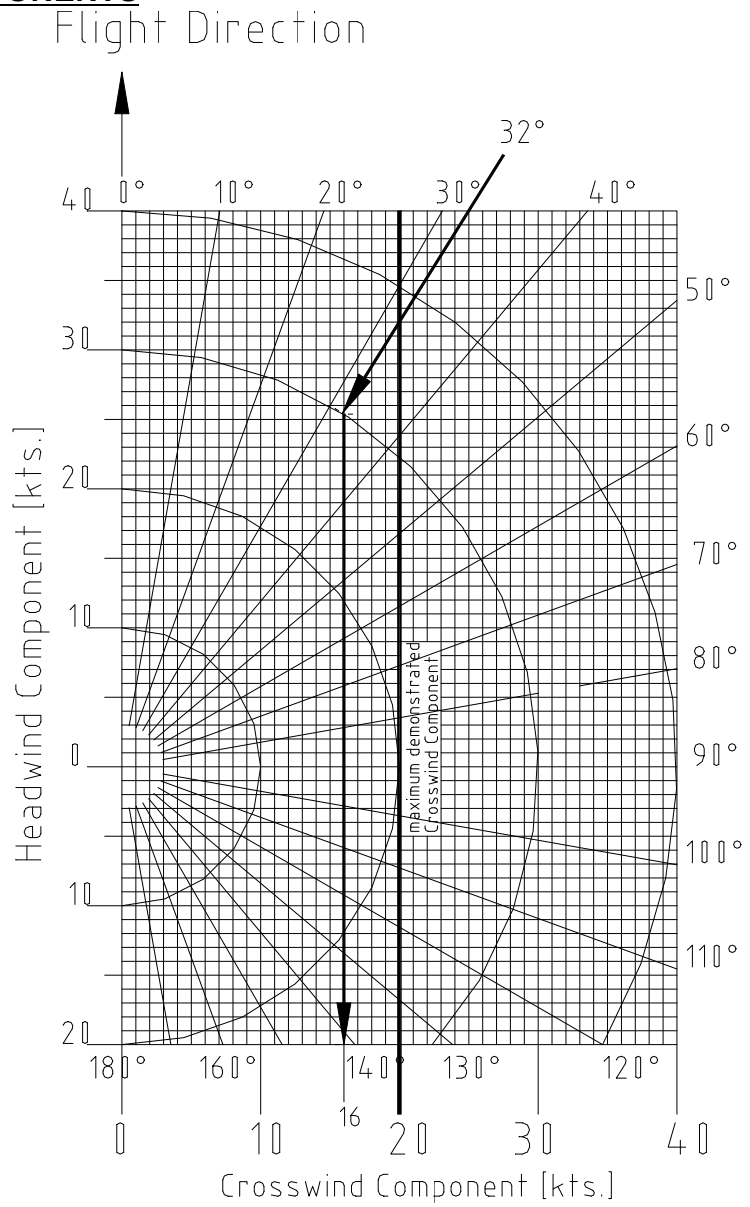
Airspeeds in KIAS at idle power:

1785 kg (3935 lb)		Bank Angle							
		0°		30°		45°		60°	
Gear	Flaps	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	UP	69	68	74	73	81	81	95	96
DOWN	APP	64	63	69	68	75	75	89	89
DOWN	LDG	62	61	67	66	75	73	89	86

1700 kg (3748 lb)		Bank Angle							
		0°		30°		45°		60°	
Gear	Flaps	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	UP	69	67	73	72	80	80	94	95
DOWN	APP	65	64	70	69	77	76	90	91
DOWN	LDG	60	59	65	63	72	70	86	83

1600 kg (3527 lb)		Bank Angle							
		0°		30°		45°		60°	
Gear	Flaps	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	UP	67	65	71	70	78	77	92	92
DOWN	APP	63	62	67	66	74	74	87	87
DOWN	LDG	58	57	63	61	70	68	84	81

5.3.5 WIND COMPONENTS



Example: Flight direction : 360°
Wind : 32°/30 kts
Result: Crosswind component : 16 kts

Max. demonstrated crosswind component : 20 kts

5.3.6 TAKE-OFF DISTANCE

Conditions:

- POWER lever . . . . . both MAX @ 2300 RPM
- Flaps . . . . . UP
- Nose wheel lift-off . . . . . @ v_R
- Airspeed for initial climb . . . . . @ v_{50}
- Runway . . . . . level, hard paved surface (concrete, asphalt, etc.)

The following factors are to be applied to the computed take-off distance for the noted condition:

- Headwind:	Decrease by 10% for each 20 kt (10.3 m/s) headwind.
- Tailwind:	Increase by 10% for each 4 kt (2.0 m/s) tailwind.
- Grass runway, dry, 5 cm (2 in) long:	Increase the ground roll by 10%.
- Grass runway, dry, 5 cm (2 in) to 10 cm (3.9 in) long:	Increase the ground roll by 15%.
- Grass runway, dry, 25 cm (9.8 in) long:	Increase the ground roll by 25%.
- Grass runway, longer than 25 cm (9.8 in):	A take-off should not be attempt.
- Grass runway, wet:	Increase the dry grass runway distance calculation by 10%.
- Soft ground:	Increase the ground roll by 45% (in addition to the grass runway distance calculation, if applicable)

- Uphill slope: Increase the ground roll by 9% for each 1% (1 m per 100 m or 1 ft per 100 ft) slope.

If brakes are not held while applying power, distances apply where full power setting is complete.

WARNING

For a safe take-off the available runway length must be at least equal to the take-off distance over a 50 ft (15 m) obstacle.

WARNING

Poor maintenance condition of the airplane, deviation from the given procedures, uneven runway, as well as unfavorable external factors (rain, unfavorable wind conditions, including cross-wind) will increase the take-off distance.

CAUTION

The factors in the above corrections are typical values. On wet ground or wet soft grass covered runways the take-off roll may become significantly longer than stated above. In any case the pilot must allow for the condition of the runway to ensure a safe take-off.

The above corrections for runway slope should be used with caution since published runway slope data is usually the net slope from one end of the runway to the other. Runways may have positions at their length at greater or lesser slopes than published slope, lengthening (or shortening) the take-off roll estimated with these tables.

NOTE

The effect of 50% of the headwind component and 150% of the tailwind component is already incorporated in the head- and tailwind factors.

Take-Off Distance - Normal Procedure - 1785 kg / 3935 lb								
Weight: 1785 kg / 3935 lb						**Flaps:** UP		
v_R: 77 KIAS						**Power:** MAX		
v_{50}: 82 KIAS						**Runway:** dry, paved, level		
Press. Alt. [ft] / [m]	**Distance** [m]	**Outside Air Temperature - [°C] / [°F]**						
		0 / 32	**10** / 50	**20** / 68	**30** / 86	**40** / 104	**50** / 122	**ISA**
SL	**Ground Roll**	390	420	440	470	540	650	428
	15 m / 50 ft	560	590	610	640	720	880	595
1000 305	**Ground Roll**	420	450	470	500	590	720	450
	15 m / 50 ft	590	610	640	670	770	950	616
2000 610	**Ground Roll**	450	470	500	550	650	800	473
	15 m / 50 ft	610	640	670	710	840	1040	638
3000 914	**Ground Roll**	470	500	540	590	710	890	497
	15 m / 50 ft	640	670	700	760	920	1150	661
4000 1219	**Ground Roll**	510	540	570	640	790	990	523
	15 m / 50 ft	670	700	730	810	1000	1260	686
5000 1524	**Ground Roll**	540	570	610	710	870		551
	15 m / 50 ft	700	730	770	880	1100		711
6000 1829	**Ground Roll**	570	610	660	780	970		580
	15 m / 50 ft	730	760	810	970	1210		737
7000 2134	**Ground Roll**	610	650	710	870	1090		611
	15 m / 50 ft	770	800	860	1050	1330		765
8000 2438	**Ground Roll**	650	700	770	940	1180		644
	15 m / 50 ft	800	840	920	1120	1420		794
9000 2743	**Ground Roll**	710	760	850	1040	1310		691
	15 m / 50 ft	860	900	1000	1230	1560		842
10000 3048	**Ground Roll**	770	820	940	1160			743
	15 m / 50 ft	920	970	1090	1340			895
For the distance in [ft] divide by 0.3048 or multiply by 3.28.								

Take-Off Distance - Normal Procedure - 1700 kg / 3748 lb								
Weight: 1700 kg / 3748 lb					**Flaps:** UP			
v_R: 77 KIAS					**Power:** MAX			
v_{50}: 81 KIAS					**Runway:** dry, paved, level			
Press. Alt.	**Distance**	**Outside Air Temperature - [°C] /** [°F]						
[ft] / [m]	**[m]**	**0 /** 32	**10 /** 50	**20 /** 68	**30 /** 86	**40 /** 104	**50 /** 122	**ISA**
SL	**Ground Roll**	360	380	410	430	490	600	392
	15 m / 50 ft	540	560	590	620	690	840	572
1000	**Ground Roll**	380	410	430	460	540	660	412
305	**15 m / 50 ft**	560	590	610	650	740	910	592
2000	**Ground Roll**	410	430	460	500	590	730	433
610	**15 m / 50 ft**	590	620	640	690	810	1000	614
3000	**Ground Roll**	440	460	490	540	650	810	456
914	**15 m / 50 ft**	620	640	670	730	880	1100	636
4000	**Ground Roll**	460	490	530	590	720	900	479
1219	**15 m / 50 ft**	640	670	710	780	960	1220	659
5000	**Ground Roll**	490	520	560	650	800		505
1524	**15 m / 50 ft**	670	700	740	850	1050		684
6000	**Ground Roll**	530	560	600	720	890		531
1829	**15 m / 50 ft**	700	740	780	930	1160		709
7000	**Ground Roll**	560	600	650	790	1000		560
2134	**15 m / 50 ft**	740	770	830	1010	1280		736
8000	**Ground Roll**	600	640	700	860	1080		590
2438	**15 m / 50 ft**	770	810	880	1080	1370		763
9000	**Ground Roll**	650	690	780	960	1200		633
2743	**15 m / 50 ft**	820	870	960	1180	1500		810
10000	**Ground Roll**	710	760	860	1060			680
3048	**15 m / 50 ft**	880	930	1050	1290			860
For the distance in [ft] divide by 0.3048 or multiply by 3.28.								

Take-Off Distance - Normal Procedure - 1600 kg / 3527 lb

Weight: 1600 kg / 3527 lb
Flaps: UP
v_R: 77 KIAS
Power: MAX
v_{50}: 81 KIAS
Runway: dry, paved, level

Press. Alt. [ft] / [m]	Distance [m]	Outside Air Temperature - [°C] / [°F]						
		0 / 32	**10** / 50	**20** / 68	**30** / 86	**40** / 104	**50** / 122	**ISA**
SL	**Ground Roll**	320	350	370	390	440	540	351
	15 m / 50 ft	520	540	560	590	660	800	545
1000 305	**Ground Roll**	350	370	390	420	480	590	369
	15 m / 50 ft	540	560	580	620	710	870	564
2000 610	**Ground Roll**	370	390	410	450	530	660	388
	15 m / 50 ft	560	590	610	650	770	960	585
3000 914	**Ground Roll**	390	410	440	490	590	730	409
	15 m / 50 ft	590	610	640	700	840	1050	606
4000 1219	**Ground Roll**	420	440	470	530	650	810	430
	15 m / 50 ft	610	640	670	740	910	1160	628
5000 1524	**Ground Roll**	440	470	500	580	720		452
	15 m / 50 ft	640	670	710	810	1000		651
6000 1829	**Ground Roll**	470	500	540	640	800		476
	15 m / 50 ft	670	700	740	880	1110		676
7000 2134	**Ground Roll**	500	540	580	710	890		502
	15 m / 50 ft	700	740	790	970	1220		701
8000 2438	**Ground Roll**	540	570	630	770	970		529
	15 m / 50 ft	730	770	840	1030	1300		727
9000 2743	**Ground Roll**	580	620	700	860	1080		568
	15 m / 50 ft	790	830	910	1130	1430		772
10000 3048	**Ground Roll**	630	680	770	950			610
	15 m / 50 ft	840	890	1000	1230			820

For the distance in [ft] divide by 0.3048 or multiply by 3.28.

Take-Off Distance - Short Field Procedure - 1785 kg / 3935 lb								
Weight: 1785 kg / 3935 lb						**Flaps: APP**		
v_R: 73 KIAS						**Power: MAX**		
v_{50}: 77 KIAS						**Runway: dry, paved, level**		
Press. Alt.	**Distance**	**Outside Air Temperature - [°C] / [°F]**						
[ft] / [m]	**[m]**	**0 / 32**	**10 / 50**	**20 / 68**	**30 / 86**	**40 / 104**	**50 / 122**	**ISA**
SL	**Ground Roll**	330	350	370	400	450	550	360
	15 m / 50 ft	540	560	590	620	690	840	572
1000	**Ground Roll**	350	380	400	430	490	600	378
305	**15 m / 50 ft**	560	590	610	650	740	910	593
2000	**Ground Roll**	380	400	420	460	540	670	398
610	**15 m / 50 ft**	590	620	640	690	810	1000	614
3000	**Ground Roll**	400	420	450	500	600	750	418
914	**15 m / 50 ft**	620	640	670	730	880	1100	636
4000	**Ground Roll**	430	450	480	540	660	830	440
1219	**15 m / 50 ft**	640	670	710	780	960	1220	660
5000	**Ground Roll**	450	480	520	600	740		463
1524	**15 m / 50 ft**	670	700	740	850	1050		684
6000	**Ground Roll**	480	510	550	660	820		488
1829	**15 m / 50 ft**	700	740	780	930	1160		709
7000	**Ground Roll**	510	550	600	730	910		514
2134	**15 m / 50 ft**	740	770	830	1010	1280		736
8000	**Ground Roll**	550	590	650	790	990		542
2438	**15 m / 50 ft**	770	810	880	1080	1370		763
9000	**Ground Roll**	600	640	710	880	1100		581
2743	**15 m / 50 ft**	820	870	960	1180	1500		810
10000	**Ground Roll**	650	690	790	970			625
3048	**15 m / 50 ft**	880	930	1050	1290			861
For the distance in [ft] divide by 0.3048 or multiply by 3.28.								

Take-Off Distance - Short Field Procedure - 1700 kg / 3748 lb

Weight: 1700 kg / 3748 lb
Flaps: APP
v_R: 73 KIAS
Power: MAX
v_{50}: 77 KIAS
Runway: dry, paved, level

Press. Alt. [ft] / [m]	Distance [m]	Outside Air Temperature - [°C] / [°F]						
		0 / 32	**10** / 50	**20** / 68	**30** / 86	**40** / 104	**50** / 122	**ISA**
SL	**Ground Roll**	330	350	370	390	440	540	355
	15 m / 50 ft	510	540	560	590	660	800	545
1000 305	**Ground Roll**	350	370	390	420	490	600	373
	15 m / 50 ft	540	560	580	620	710	870	564
2000 610	**Ground Roll**	370	390	420	450	540	660	392
	15 m / 50 ft	560	590	610	650	770	960	585
3000 914	**Ground Roll**	390	420	450	490	590	740	412
	15 m / 50 ft	590	610	640	700	840	1050	606
4000 1219	**Ground Roll**	420	450	480	530	650	820	434
	15 m / 50 ft	610	640	670	740	910	1160	628
5000 1524	**Ground Roll**	450	470	510	590	730		457
	15 m / 50 ft	640	670	710	810	1000		651
6000 1829	**Ground Roll**	480	510	540	650	810		481
	15 m / 50 ft	670	700	740	880	1110		675
7000 2134	**Ground Roll**	510	540	590	720	900		507
	15 m / 50 ft	700	740	790	970	1220		701
8000 2438	**Ground Roll**	540	580	640	780	980		534
	15 m / 50 ft	730	770	840	1030	1300		727
9000 2743	**Ground Roll**	590	630	700	870	1090		573
	15 m / 50 ft	790	830	910	1130	1430		772
10000 3048	**Ground Roll**	640	680	780	960			616
	15 m / 50 ft	840	890	1000	1230			820

For the distance in [ft] divide by 0.3048 or multiply by 3.28.

Take-Off Distance - Short Field Procedure - 1600 kg / 3527 lb								
Weight: 1600 kg / 3527 lb					**Flaps:** APP			
v_R: 73 KIAS					**Power:** MAX			
v_{50}: 77 KIAS					**Runway:** dry, paved, level			
Press. Alt.	**Distance**	**Outside Air Temperature - [°C] /** [°F]						
[ft] / [m]	**[m]**	**0 /** 32	**10 /** 50	**20 /** 68	**30 /** 86	**40 /** 104	**50 /** 122	**ISA**
SL	**Ground Roll**	320	340	360	390	440	530	348
	15 m / 50 ft	480	510	530	550	620	760	513
1000	**Ground Roll**	340	360	390	410	480	580	366
305	**15 m / 50 ft**	510	530	550	580	670	820	531
2000	**Ground Roll**	360	390	410	440	530	650	385
610	**15 m / 50 ft**	530	550	580	620	720	900	550
3000	**Ground Roll**	390	410	440	480	580	720	405
914	**15 m / 50 ft**	550	580	600	660	790	990	570
4000	**Ground Roll**	410	440	470	520	640	800	426
1219	**15 m / 50 ft**	580	600	630	700	860	1090	591
5000	**Ground Roll**	440	470	500	580	710		448
1524	**15 m / 50 ft**	600	630	670	760	950		613
6000	**Ground Roll**	470	500	530	640	790		472
1829	**15 m / 50 ft**	630	660	700	830	1040		636
7000	**Ground Roll**	500	530	580	710	890		497
2134	**15 m / 50 ft**	660	690	740	910	1150		660
8000	**Ground Roll**	530	570	630	770	960		524
2438	**15 m / 50 ft**	690	730	790	970	1230		684
9000	**Ground Roll**	580	620	690	850	1070		563
2743	**15 m / 50 ft**	740	780	860	1060	1340		726
10000	**Ground Roll**	630	670	770	940			605
3048	**15 m / 50 ft**	790	840	940	1160			771
For the distance in [ft] divide by 0.3048 or multiply by 3.28.								

5.3.7 CLIMB PERFORMANCE - TAKE-OFF CLIMB

Conditions:

- POWER lever . . . . . both MAX @ 2300 RPM
- Flaps . . . . . APP or UP
- Landing gear . . . . . retracted
- Airspeed . . . . . v_Y

The climb performance tables show the rate of climb. The gradient of climb can be calculated using the following formula:

$$Gradient\,[\%] = \frac{ROC\,[fpm]}{TAS\,[KTAS]} \cdot 0.98$$

Take-Off Climb - Flaps UP

Flaps: UP **Power: MAX**

v_Y: 81 KIAS (up to 1700 kg / 3748 lb)
82 KIAS (above 1700 kg / 3748 lb) **Gear: retracted**

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C] / [°F]								ISA
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	
1785 / 3935	SL		1340	1330	1320	1320	1310	1290	1210	990	1315
	2000	610	1330	1320	1310	1300	1290	1250	1100	850	1297
	4000	1219	1310	1300	1280	1270	1250	1180	950	690	1276
	6000	1829	1280	1270	1260	1240	1200	1040	790		1256
	8000	2438	1260	1240	1230	1200	1150	920	660		1227
	10000	3048	1160	1140	1120	1090	1000	780			1133
	12000	3658	1050	1030	1010	980	850	620			1030
	14000	4267	940	920	900	840	690	460			927
	16000	4877	830	800	780	690	530				819
	18000	5486	710	680	650	540	370				708
1700 / 3748	SL		1450	1440	1430	1430	1420	1390	1320	1080	1423
	2000	610	1430	1430	1420	1410	1390	1360	1190	940	1406
	4000	1219	1420	1410	1390	1380	1360	1290	1040	760	1385
	6000	1829	1390	1380	1370	1350	1310	1140	870		1366
	8000	2438	1370	1350	1340	1310	1260	1020	740		1337
	10000	3048	1260	1250	1230	1190	1100	860			1239
	12000	3658	1160	1140	1120	1080	940	700			1133
	14000	4267	1040	1020	1000	940	780	540			1027
	16000	4877	920	900	880	780	610				915
	18000	5486	800	770	740	620	440				800

Take-Off Climb - Flaps UP

Flaps: UP — **Power: MAX**

v_Y: 81 KIAS (up to 1700 kg / 3748 lb)
82 KIAS (above 1700 kg / 3748 lb) — **Gear: retracted**

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C] / [°F]								
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	**ISA**
1600 / 3527	**SL**		1590	1580	1570	1570	1560	1540	1450	1200	1564
	2000	610	1570	1570	1560	1550	1540	1500	1320	1050	1547
	4000	1219	1560	1550	1540	1520	1500	1430	1160	860	1527
	6000	1829	1540	1520	1510	1490	1450	1270	990		1509
	8000	2438	1510	1500	1480	1450	1400	1140	840		1480
	10000	3048	1400	1390	1370	1330	1230	980			1378
	12000	3658	1290	1270	1250	1210	1060	810			1267
	14000	4267	1170	1150	1130	1060	890	630			1156
	16000	4877	1050	1020	1000	900	720				1039
	18000	5486	920	890	860	730	540				920

For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

Take-Off Climb - Flaps APP

Flaps: APP — **Power: MAX**

v_Y: 77 KIAS — **Gear: retracted**

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C] / [°F]								ISA
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	
1785 / 3935	SL		1120	1120	1110	1100	1100	1080	1030	840	1100
	2000	610	1110	1100	1100	1090	1090	1050	930	730	1091
	4000	1219	1100	1090	1080	1070	1050	1000	820	600	1077
	6000	1829	1090	1070	1060	1050	1020	890	680		1059
	8000	2438	1060	1050	1040	1020	980	790	580		1043
	10000	3048	990	970	960	930	860	670			964
	12000	3658	900	890	870	840	740	550			886
	14000	4267	810	800	780	730	610	420			801
	16000	4877	720	700	690	610	480				716
	18000	5486	620	610	580	490	350				626
1700 / 3748	SL		1210	1210	1200	1190	1190	1170	1110	920	1189
	2000	610	1200	1190	1190	1180	1180	1140	1010	800	1181
	4000	1219	1190	1180	1170	1160	1140	1090	890	660	1167
	6000	1829	1180	1160	1150	1140	1110	970	750		1149
	8000	2438	1150	1140	1130	1110	1070	870	640		1134
	10000	3048	1070	1060	1050	1020	950	750			1052
	12000	3658	990	970	960	930	820	620			971
	14000	4267	900	880	860	810	680	480			883
	16000	4877	800	780	760	690	550				796
	18000	5486	700	680	660	560	410				702

Take-Off Climb - Flaps APP

Flaps: APP — **Power: MAX**

v_Y: 77 KIAS — **Gear: retracted**

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C] / [°F]								
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	ISA
1600 / 3527	SL		1320	1320	1310	1310	1300	1290	1230	1010	1305
	2000	610	1320	1310	1300	1300	1290	1260	1110	890	1297
	4000	1219	1300	1300	1290	1280	1260	1200	990	750	1284
	6000	1829	1290	1280	1270	1260	1230	1080	840		4266
	8000	2438	1270	1260	1250	1220	1180	980	730		1252
	10000	3048	1190	1170	1160	1130	1050	840			1166
	12000	3658	1100	1080	1070	1040	920	710			1082
	14000	4267	1000	990	970	920	780	570			990
	16000	4877	900	890	870	790	640				899
	18000	5486	800	780	760	650	490				802

For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

5.3.8 CLIMB PERFORMANCE - CRUISE CLIMB

Conditions:

- POWER lever . . . . . both MAX @ 2300 RPM
- Flaps . . . . . UP
- Airspeed . . . . . v_{climb}

The climb performance tables show the rate of climb. The gradient of climb can be calculated using the following formula:

$$Gradient\,[\%] = \frac{ROC\,[fpm]}{TAS\,[KTAS]} \cdot 0.98$$

Cruise Climb - Flaps UP

Flaps: UP **Power: MAX**

v_{climb}: 87 KIAS (up to 1700 kg / 3748 lb)
88 KIAS (above 1700 kg / 3748 lb) **Gear: retracted**

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C] / [°F]								
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	ISA
1785 / 3935	SL		1310	1300	1300	1280	1270	1250	1190	980	1280
	2000	610	1300	1290	1270	1260	1260	1220	1070	850	1264
	4000	1219	1270	1260	1260	1240	1220	1160	940	690	1248
	6000	1829	1260	1240	1230	1210	1180	1020	790		1225
	8000	2438	1230	1220	1200	1170	1130	920	670		1204
	10000	3048	1140	1120	1110	1080	990	780			1113
	12000	3658	1040	1020	1010	970	850	640			1022
	14000	4267	940	920	900	850	710	500			926
	16000	4877	840	820	800	710	560				829
	18000	5486	730	710	680	570	420				730
1700 / 3748	SL		1400	1400	1390	1380	1370	1350	1280	1060	1377
	2000	610	1390	1380	1370	1360	1350	1320	1160	920	1362
	4000	1219	1370	1360	1350	1340	1310	1250	1030	760	1346
	6000	1829	1350	1340	1330	1310	1280	1110	870		1323
	8000	2438	1330	1310	1300	1270	1230	1000	740		1302
	10000	3048	1230	1220	1200	1170	1080	860			1208
	12000	3658	1130	1120	1100	1060	940	710			1113
	14000	4267	1030	1010	990	930	790	560			1014
	16000	4877	920	900	880	790	630				914
	18000	5486	810	790	760	650	480				811

Cruise Climb - Flaps UP

Flaps: UP
v_{climb}: 87 KIAS (up to 1700 kg / 3748 lb)
88 KIAS (above 1700 kg / 3748 lb)

Power: MAX
Gear: retracted

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C] / [°F]								
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	ISA
1600 / 3527	SL		1530	1520	1520	1510	1500	1480	1400	1160	1504
	2000	610	1520	1510	1500	1490	1480	1440	1280	1020	1489
	4000	1219	1500	1490	1480	1470	1440	1370	1130	850	1473
	6000	1829	1480	1470	1450	1440	1400	1230	960		1451
	8000	2438	1450	1440	1430	1400	1350	1110	830		1430
	10000	3048	1360	1340	1320	1290	1200	960			1331
	12000	3658	1250	1230	1220	1180	1040	800			1232
	14000	4267	1140	1120	1100	1040	890	650			1129
	16000	4877	1030	1010	990	900	730				1024
	18000	5486	920	890	860	740	570				917

For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

5.3.9 ONE ENGINE INOPERATIVE CLIMB PERFORMANCE

Conditions:

- Remaining engine . . . . . MAX @ 2300 RPM
- Dead engine . . . . . feathered and secured
- Flaps . . . . . UP
- Airspeed . . . . . v_{YSE}
- Landing gear . . . . . retracted
- Sideslip . . . . . half ball out

NOTE

With respect to handling and performance, the left-hand engine (pilots view) is considered the "critical" engine.

The climb performance tables show the rate of climb. The gradient of climb can be calculated using the following formula:

$$Gradient\ [\%] = \frac{ROC\ [fpm]}{TAS\ [KTAS]} \cdot 0.98$$

One Engine Inoperative Climb

Flaps: UP — **Power:** feathered/MAX

v_{YSE}: 88 KIAS — **Gear:** retracted

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C] / [°F]								ISA
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	
1785 / 3935	SL		275	265	255	245	240	225	200	120	243
	2000	610	260	250	235	230	220	200	145	60	227
	4000	1219	240	230	220	205	190	165	85	-15	210
	6000	1829	220	205	195	180	160	100	10		191
	8000	2438	195	180	170	150	130	50	-45		172
	10000	3048	145	130	115	95	65	-20			122
	12000	3658	90	75	60	40	-5	-85			72
	14000	4267	30	15	0	-25	-75	-155			20
	16000	4877	-30	-45	-60	-95	-150				-34
	18000	5486	-90	-105	-125	-160	-220				-89
1700 / 3748	SL		320	315	305	295	285	270	245	160	291
	2000	610	305	295	285	275	270	245	190	100	276
	4000	1219	285	275	265	255	240	210	125	25	260
	6000	1829	265	255	245	230	210	145	50		240
	8000	2438	245	230	220	200	175	90	-10		221
	10000	3048	190	180	165	145	110	25			171
	12000	3658	135	120	105	85	40	-50			120
	14000	4267	75	60	45	20	-35	-120			66
	16000	4877	15	0	-15	-50	-110				11
	18000	5486	-45	-65	-80	-120	-185				-45

One Engine Inoperative Climb

Flaps: UP **Power: feathered/MAX**

v_{YSE}: 88 KIAS **Gear: retracted**

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C] / [°F]								
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	**ISA**
1600 / 3527	**SL**		380	375	370	360	350	335	305	215	353
	2000	610	370	360	350	340	330	310	245	150	338
	4000	1219	350	340	330	320	300	275	180	70	323
	6000	1829	330	320	305	295	275	205	100		304
	8000	2438	305	295	285	265	240	150	40		285
	10000	3048	255	240	225	210	170	75			233
	12000	3658	195	180	170	145	95	0			180
	14000	4267	135	120	105	80	20	-75			125
	16000	4877	75	60	45	5	-60				69
	18000	5486	10	-5	-25	-70	-135				11

CAUTION: Dark grey shaded areas indicate a climb rate of less than 50 ft/min.
For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

5.3.10 TIME, FUEL AND DISTANCE TO CLIMB

Conditions:

- Power lever . . . . . both MAX
- Flaps . . . . . UP
- Landing gear . . . . . retracted
- Airspeed . . . . . v_Y

NOTE

Distances shown are based on zero wind. Fuel for start, taxi and take-off not included. Add 10% to the time, fuel and distance for each 10° C (12° F) increase in OAT.

Example:

OAT at take-off . . . . . 11°C (52°F)
Airfield pressure altitude . . . . . 2000 ft (1200 m)
Initial climb weight . . . . . 1785 kg (3935 lb)
OAT at cruise . . . . . -17° C (2° F)
Cruise altitude . . . . . 16000 ft (4900 m)

Time, fuel and distance to climb at airfield: 2 min, 0.5 US gal and 3 NM (1)

Time, fuel and distance to climb at cruise: 14 min, 3.8 US gal and 24 NM (2)

Subtract (1) from (2) to obtain time, fuel and distance to climb from airfield to cruise:

Time to cruise altitude: 14 min - 2 min = 12 min

Fuel to cruise altitude: 3.8 US gal - 0.5 US gal = 3.3 US gal

Distance to cruise altitude: 24 NM - 3 NM = 21 NM

Time, Fuel and Distance to Climb

Flaps: UP
v_Y: 88 KIAS (above 1700 kg / 3935 lb)
v_Y: 87 KIAS (up to 1700 kg / 3935 lb)
Power: MAX
Gear: retracted

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	OAT [°C]	OAT [°F]	TAS [kt]	RoC [ft/min]	RoC [m/s]	Time [min]	Fuel [US gal]	Dist-ance [NM]
1785 / 3935	**SL**		**15**	59	88	1280	6.5	0	0.0	0
	2000	600	**11**	52	89	1270	6.5	2	0.5	2
	4000	1219	**7**	45	91	1265	6.4	3	0.9	5
	6000	1829	**3**	38	92	1255	6.4	5	1.4	7
	8000	2438	**-1**	30	93	1245	6.3	6	1.9	10
	10000	3048	**-5**	23	95	1230	6.2	8	2.4	13
	12000	3658	**-9**	16	96	1200	6.1	10	2.9	16
	14000	4267	**-13**	9	98	1170	5.9	12	3.4	20
	16000	4877	**-17**	2	100	1130	5.8	14	4.0	24
	18000	5486	**-21**	-5	101	1095	5.6	16	4.5	28
1700 / 3748	**SL**		**15**	59	88	1375	7.0	0	0.0	0
	2000	600	**11**	52	89	1370	7.0	1	0.4	2
	4000	1219	**7**	45	91	1360	6.9	3	0.9	4
	6000	1829	**3**	38	92	1355	6.9	4	1.3	7
	8000	2438	**-1**	30	93	1345	6.8	6	1.8	9
	10000	3048	**-5**	23	95	1325	6.7	8	2.2	12
	12000	3658	**-9**	16	96	1300	6.6	9	2.7	15
	14000	4267	**-13**	9	98	1265	6.4	11	3.2	18
	16000	4877	**-17**	2	100	1225	6.2	13	3.7	22
	18000	5486	**-21**	-5	101	1185	6.0	15	4.2	26

Time, Fuel and Distance to Climb

Flaps: UP
v_Y: 88 KIAS (above 1700 kg / 3935 lb)
v_Y: 87 KIAS (up to 1700 kg / 3935 lb)
Power: MAX
Gear: retracted

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	OAT [°C]	OAT [°F]	TAS [kt]	RoC [ft/min]	RoC [m/s]	Time [min]	Fuel [US gal]	Dist-ance [NM]
1600 / 3527	**SL**		**15**	59	79	1505	7.6	0	0.0	0
	2000	600	**11**	52	89	1495	7.6	1	0.4	2
	4000	1219	**7**	45	91	1490	7.6	3	0.8	4
	6000	1829	**3**	38	92	1480	7.5	4	1.2	6
	8000	2438	**-1**	30	93	1470	7.5	5	1.6	8
	10000	3048	**-5**	23	95	1450	7.4	7	2.0	11
	12000	3658	**-9**	16	96	1425	7.2	8	2.5	13
	14000	4267	**-13**	9	98	1390	7.1	10	2.9	16
	16000	4877	**-17**	2	100	1350	6.9	12	3.3	20
	18000	5486	**-21**	-5	101	1310	6.6	14	3.8	23

5.3.11 CRUISE PERFORMANCE

Conditions:

- Flaps . . . . . UP
- Landing gear . . . . . retracted
- Weight . . . . . 1785 kg

For conversion of OAT to delta-ISA temperatures refer to Chapter 5.3.3 - INTERNATIONAL STANDARD ATMOSPHERE.

Cruise Performance

Press. Alt. [ft] / [m]	Outside Air Temperature - [°C]														
	ISA-10			ISA			ISA+10			ISA+20			ISA+30		
	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]
2000 610	100	17.8	161	100	17.8	163	95	16.7	161	90	15.6	160	80	13.6	154
	75	12.7	144	75	12.7	146	75	12.7	147	75	12.7	149	75	12.7	150
	60	9.8	132	60	9.8	133	60	9.8	134	60	9.8	136	60	9.8	137
	45	7.2	116	45	7.2	117	45	7.2	118	45	7.2	119	45	7.2	120
4000 1219	100	17.8	164	100	17.8	166	95	16.7	165	90	15.6	163	80	13.6	157
	75	12.7	147	75	12.7	149	75	12.7	150	75	12.7	152	75	12.7	153
	60	9.8	134	60	9.8	135	60	9.8	137	60	9.8	138	60	9.8	140
	45	7.2	117	45	7.2	118	45	7.2	120	45	7.2	121	45	7.2	122
6000 1829	100	17.8	167	100	17.8	169	95	16.7	168	90	15.6	166	80	13.6	160
	75	12.7	150	75	12.7	151	75	12.7	153	75	12.7	155	75	12.7	156
	60	9.8	136	60	9.8	138	60	9.8	139	60	9.8	141	60	9.8	142
	45	7.2	119	45	7.2	120	45	7.2	121	45	7.2	122	45	7.2	123
8000 2438	100	17.8	170	100	17.8	172	100	17.8	174	100	17.8	175	90	15.6	171
	75	12.7	152	75	12.7	154	75	12.7	156	75	12.7	157	75	12.7	159
	60	9.8	139	60	9.8	140	60	9.8	142	60	9.8	143	60	9.8	145
	45	7.2	121	45	7.2	122	45	7.2	123	45	7.2	124	45	7.2	125
10000 3048	95	16.7	170	95	16.7	172	95	16.7	174	95	16.7	176	90	15.6	174
	75	12.7	155	75	12.7	157	75	12.7	159	75	12.7	160	75	12.7	162
	60	9.8	141	60	9.8	143	60	9.8	144	60	9.8	146	60	9.8	147
	45	7.2	123	45	7.2	124	45	7.2	125	45	7.2	126	45	7.2	127
12000 3658	95	16.7	172	95	16.7	174	95	16.7	176	90	15.6	176	85	14.6	174
	75	12.7	158	75	12.7	160	75	12.7	162	75	12.7	163	75	12.7	165
	60	9.8	144	60	9.8	145	60	9.8	147	60	9.8	148	60	9.8	150
	45	7.2	125	45	7.2	126	45	7.2	127	45	7.2	128	45	7.2	129
14000 4267	90	15.6	172	90	16.7	174	90	15.6	176	85	14.6	175	85	14.6	177
	75	12.7	161	75	12.7	163	75	12.7	165	75	12.7	166	75	12.7	168
	60	9.8	146	60	9.8	148	60	9.8	149	60	9.8	151	60	9.8	152
	45	7.2	127	45	7.2	128	45	7.2	129	45	7.2	130	45	7.2	130

Cruise Performance

Press. Alt. [ft] / [m]	Outside Air Temperature - [°C]														
	ISA-10			ISA			ISA+10			ISA+20			ISA+30		
	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]
16000 4877	85	14.6	172	85	14.6	174	85	14.6	176	85	14.6	178	80	13.6	176
	75	12.7	164	75	12.7	166	75	12.7	167	75	12.7	169	70	12.7	166
	60	9.8	149	60	9.8	150	60	9.8	152	60	9.8	153	60	9.8	155
	45	7.2	128	45	7.2	129	45	7.2	130	45	7.2	131	45	7.2	132
18000 5486	75	12.7	167	75	12.7	169	75	12.7	170	75	12.7	172	75	12.7	174
	60	9.8	151	60	9.8	153	60	9.8	154	60	9.8	156	60	9.8	157
	45	7.2	130	45	7.2	131	45	7.2	132	45	7.2	132	45	7.2	133

5.3.12 LANDING DISTANCE

Conditions:

- Power lever . . . . . both IDLE
- Flaps . . . . . LDG, APP or UP
- Runway . . . . . dry, paved, level
- Approach speed . . . . . v_{REF}

The following factors are to be applied to the computed landing distance for the noted condition:

- Headwind:	Decrease by 10% for each 14 kt (7.2 m/s) headwind.
- Tailwind:	Increase by 10% for each 3 kt (1.5 m/s) tailwind.
- Paved runway, wet:	Increase by 15%.
- Grass runway, dry, 5 cm (2 in) long:	Increase the ground roll by 10%.
- Grass runway, dry, 5 cm (2 in) to 10 cm (3.9 in) long:	Increase the ground roll by 15%.
- Grass runway, dry, longer than 10 cm (3.9 in):	Increase the ground roll at least by 25%.
- Grass runway, wet or soft runway:	Increase the ground roll by 10%.
- Downhill slope:	Increase the ground roll by 9% for each 1% (1 m per 100 m or 1 ft per 100 ft) of slope.

WARNING

For a safe landing the available runway length must be at least equal to the landing distance over a 50 ft (15 m) obstacle.

WARNING

Poor maintenance condition of the airplane, deviation from the given procedures, uneven runway, as well as unfavorable external factors (rain, unfavorable wind conditions, including cross-wind) will increase the landing distance.

CAUTION

The factors in the above corrections are typical values. On wet ground or wet soft grass covered runways the landing distance may become significantly longer than stated above. In any case the pilot must allow for the condition of the runway to ensure a safe landing.

The above corrections for runway slope should be used with caution since published runway slope data is usually the net slope from one end of the runway to the other. Runways may have positions at their length at greater or lesser slopes than published slope, lengthening (or shortening) the landing roll estimated with these tables.

NOTE

The effect of 50% of the headwind component and 150% of the tailwind component is already incorporated in the head- and tailwind factors.

Landing Distance - Flaps LDG - 1785 kg / 3935 lb								
Weight:	**1785 kg / 3935 lb**				**Flaps:**	**LDG**		
v_{REF}:	**82 KIAS**				**Power:**	**IDLE**		
					Runway:	**dry, paved, level**		
Press. Alt.	**Distance**	**Outside Air Temperature - [°C] /** [°F]						
[ft] / [m]	**[m]**	**0 /** 32	**10 /** 50	**20 /** 68	**30 /** 86	**40 /** 104	**50 /** 122	**ISA**
SL	**Ground Roll**	380	390	410	420	430	450	397
	15 m / 50 ft	680	700	730	750	770	790	710
1000	**Ground Roll**	390	410	420	430	450	460	407
305	**15 m / 50 ft**	700	730	750	770	790	820	729
2000	**Ground Roll**	410	420	440	450	460	480	418
610	**15 m / 50 ft**	730	750	770	800	820	840	749
3000	**Ground Roll**	420	440	450	460	480	490	431
914	**15 m / 50 ft**	750	770	800	820	850	870	767
4000	**Ground Roll**	440	450	470	480	500	510	443
1219	**15 m / 50 ft**	770	800	820	850	870	900	788
5000	**Ground Roll**	450	470	480	500	510	530	455
1524	**15 m / 50 ft**	800	830	850	880	900	930	810
6000	**Ground Roll**	470	480	500	520	530	550	470
1829	**15 m / 50 ft**	830	850	880	910	930	960	831
7000	**Ground Roll**	490	500	520	530	550	570	483
2134	**15 m / 50 ft**	860	880	910	940	970	990	854
8000	**Ground Roll**	500	520	540	550	570	590	497
2438	**15 m / 50 ft**	880	910	940	970	1000	1030	878
9000	**Ground Roll**	520	540	560	570	590	610	512
2743	**15 m / 50 ft**	920	950	970	1000	1030	1060	904
10000	**Ground Roll**	540	560	580	600	610	640	527
3048	**15 m / 50 ft**	950	980	1010	1040	1070	1100	930
For the distance in [ft] divide by 0.3048 or multiply by 3.28.								

Landing Distance - Flaps LDG - 1700 kg / 3748 lb								
Weight: 1700 kg / 3748 lb					**Flaps:** LDG			
v_{REF}: 79 KIAS					**Power:** IDLE			
					Runway: dry, paved, level			
Press. Alt. [ft] / [m]	**Distance [m]**	**Outside Air Temperature - [°C] /** [°F]						
		0 / 32	**10** / 50	**20** / 68	**30** / 86	**40** / 104	**50** / 122	**ISA**
SL	**Ground Roll**	310	320	330	340	350	360	324
	15 m / 50 ft	550	570	590	600	620	640	572
1000	**Ground Roll**	320	330	340	350	360	370	332
305	**15 m / 50 ft**	570	590	600	620	640	660	588
2000	**Ground Roll**	330	340	350	360	380	390	340
610	**15 m / 50 ft**	590	610	620	640	660	680	604
3000	**Ground Roll**	340	360	370	380	390	400	350
914	**15 m / 50 ft**	610	620	640	660	680	700	618
4000	**Ground Roll**	360	370	380	390	400	410	359
1219	**15 m / 50 ft**	620	640	660	680	700	720	635
5000	**Ground Roll**	370	380	390	400	420	430	370
1524	**15 m / 50 ft**	650	670	680	710	730	750	651
6000	**Ground Roll**	380	390	410	420	430	440	380
1829	**15 m / 50 ft**	670	690	710	730	750	770	669
7000	**Ground Roll**	390	410	420	430	440	460	390
2134	**15 m / 50 ft**	690	710	730	750	780	800	688
8000	**Ground Roll**	410	420	430	450	460	470	402
2438	**15 m / 50 ft**	710	730	760	780	800	820	705
9000	**Ground Roll**	420	440	450	460	480	490	413
2743	**15 m / 50 ft**	740	760	780	810	830	850	725
10000	**Ground Roll**	440	450	460	480	490	510	425
3048	**15 m / 50 ft**	760	790	810	830	860	880	747
For the distance in [ft] divide by 0.3048 or multiply by 3.28.								

Landing Distance - Flaps LDG - 1600 kg / 3527 lb								
Weight:	**1600 kg / 3527 lb**				**Flaps:**	**LDG**		
v_{REF}:	**79 KIAS**				**Power:**	**IDLE**		
					Runway:	**dry, paved, level**		
Press. Alt.	**Distance**	**Outside Air Temperature - [°C] /** [°F]						
[ft] / [m]	**[m]**	**0 /** 32	**10 /** 50	**20 /** 68	**30 /** 86	**40 /** 104	**50 /** 122	**ISA**
SL	**Ground Roll**	300	310	310	320	330	340	306
	15 m / 50 ft	520	540	560	570	590	610	545
1000	**Ground Roll**	310	310	330	330	340	350	314
305	**15 m / 50 ft**	540	560	570	590	610	620	560
2000	**Ground Roll**	310	330	340	350	360	370	322
610	**15 m / 50 ft**	560	580	590	610	630	650	575
3000	**Ground Roll**	330	340	350	360	370	380	331
914	**15 m / 50 ft**	580	590	610	630	650	670	589
4000	**Ground Roll**	340	350	360	370	380	390	340
1219	**15 m / 50 ft**	590	610	630	650	670	690	605
5000	**Ground Roll**	350	360	370	380	390	410	350
1524	**15 m / 50 ft**	610	630	650	670	690	710	620
6000	**Ground Roll**	360	370	380	390	410	420	359
1829	**15 m / 50 ft**	640	650	670	700	720	730	637
7000	**Ground Roll**	370	380	400	410	420	430	369
2134	**15 m / 50 ft**	650	680	700	720	740	760	655
8000	**Ground Roll**	390	400	410	420	440	450	380
2438	**15 m / 50 ft**	680	700	720	740	760	780	672
9000	**Ground Roll**	400	410	420	440	450	460	391
2743	**15 m / 50 ft**	700	720	750	770	790	810	691
10000	**Ground Roll**	410	430	440	450	470	480	403
3048	**15 m / 50 ft**	730	750	770	790	820	840	708
For the distance in [ft] divide by 0.3048 or multiply by 3.28.								

5.3.13 GRADIENT OF CLIMB ON GO-AROUND

Conditions:

- Power lever . . . . . both MAX
- Flaps . . . . . LDG
- Landing gear . . . . . extended
- Airspeed:
  Up to 1700 kg (3748 lb) . . . . . v_{REF} = 79 KIAS
  Above 1700 kg (3748 lb) . . . . . v_{REF} = 82 KIAS

The climb performance charts show the rate of climb. The gradient and angle of climb can be calculated using the following formula:

$$Gradient\,[\%] = \frac{ROC\,[fpm]}{TAS\,[KTAS]} \cdot 0.98$$

NOTE

The angles of climb at MSL and ISA condition are:

5.1° for Max. Take-Off /Landing Mass (1700 kg / 3748 lb)

4.3° for Max. Take-Off / Landing Mass (1785 kg / 3935 lb)

Go-Around Climb Performance

Flaps: LDG **Power: MAX**

v_{REF}: 82 KIAS (above 1700 kg / 3935 lb
v_{REF}: 79 KIAS (up to 1700 kg / 3935 lb) **Gear: extended**

Weight [kg] / [lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C] / [°F]								ISA
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	
1785 / 3935	SL		665	645	625	610	595	570	510	335	602
	2000	610	630	610	595	580	555	515	395	205	576
	4000	1219	595	580	555	535	500	445	265	50	539
	6000	1829	555	530	510	485	440	310	110		503
	8000	2438	510	490	460	425	375	200	-15		464
	10000	3048	400	375	350	310	235	55			361
1700 / 3748	SL		770	750	735	715	700	675	615	425	709
	2000	610	735	715	700	685	665	620	495	295	685
	4000	1219	700	685	665	640	610	550	360	135	648
	6000	1829	665	640	620	595	550	410	200		613
	8000	2438	620	600	570	535	485	295	70		574
	10000	3048	510	480	455	415	340	145			469
1600 / 3527	SL		905	890	870	855	840	815	750	545	848
	2000	610	870	855	840	825	805	760	625	405	824
	4000	1219	840	825	805	785	750	690	480	235	789
	6000	1829	805	780	760	740	690	540	310		755
	8000	2438	760	740	715	675	625	420	175		717
	10000	3048	650	620	595	555	470	265			608

For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

5.3.14 APPROVED NOISE DATA

Max. Flight Mass 1785 kg (3935 lb)

ICAO Annex 16 Chapter X, App.6. . . . . 80.9 dB(A)
CS-36 Subpart C. . . . . 80.9 dB(A)

14 CFR Part 36, App.G. . . . . 80.9 dB(A)

No determination has been made by the Federal Aviation Administration that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of, any airport.

6. MASS AND BALANCE

6.5 EQUIPMENT LIST AND EQUIPMENT INVENTORY

Airplane Serial No.:		Registration:		Date:	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**inst'd**
COMMUNICATION / NAVIGAGTION					
Backup Airspeed Indicator	8030	8030-B.916	United Instruments		
FLIGHT CONTROLS					
Variable Elevator Stop		D64-2733-12-00-01	Diamond Aircraft		
ENGINE					
LH Engine	TAE 125-02-114	05-7200-K000601	Technify Motors		
RH Engine	TAE 125-02-114	05-7200-K000601	Technify Motors		

7. DESCRIPTION OF THE AIRPLANE AND ITS SYSTEMS

7.3 FLIGHT CONTROLS

Variable Elevator Stop:

The DA 42 is equipped with an electrically operated actuator that limits the elevator-up travel to 13° as soon as the power setting of both engines exceeds approximately 20 % (approach power setting). This is 2.5° less than the 15.5° full deflection.

The linear actuator acts as a movable stop and is controlled by two switches, one for each POWER lever. When the power of one engine is reduced below approximately 20 %, full elevator deflection is regained.

An amber annunciation (CAUTION) on the G1000 display is provided to inform the pilot in case a malfunction occurs. The annunciation illuminates when the variable stop should be in place and is actually not activated (power on condition) or should be retracted and actually limits the elevator travel (power off condition).

7.9 POWER PLANT

7.9.1 ENGINES, GENERAL

There are two Thielert Aircraft Engines TAE125-02-114 installed, which have the following principal specifications:

- Liquid-cooled four-cylinder four-stroke Diesel-cycle engine with wet sump lubrication
- Inline construction
- Common rail direct injection.
- Propeller speed reducing gear 1:1.69
- Digital engine control with integrated propeller governor (separate oil system)
- Turbo charger with intercooler

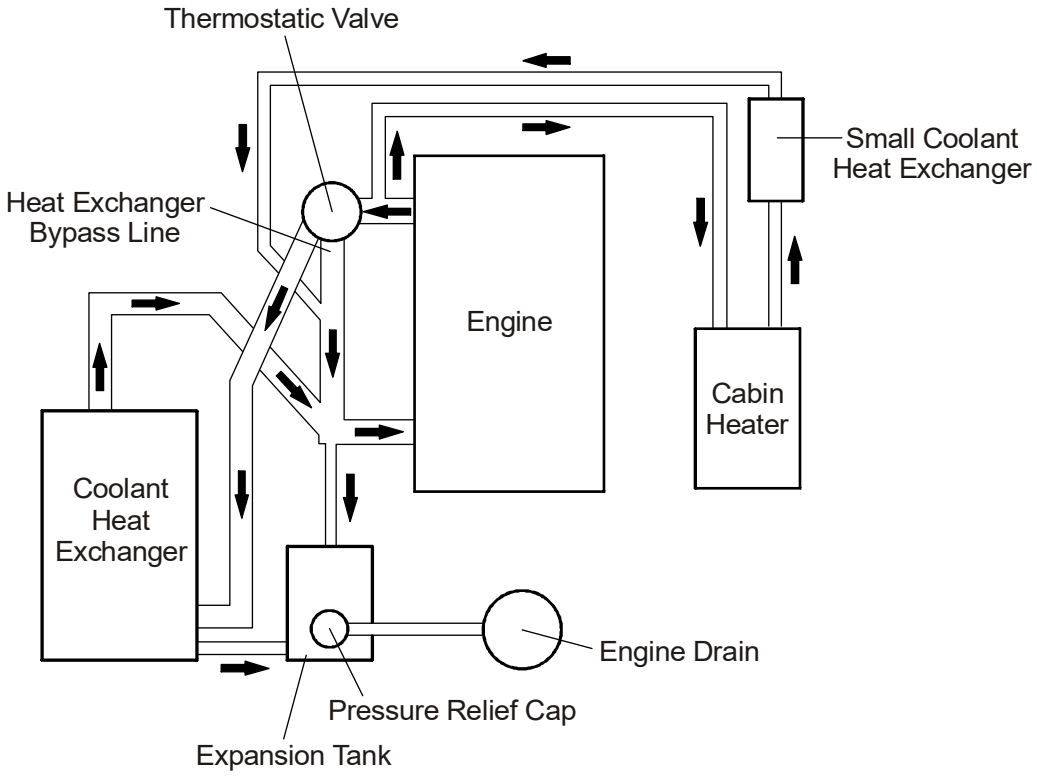
Displacement:

Max. power: 114 kW (155 DIN-HP) at 2300 RPM at sea level and ISA

Max. continuous power: 114 kW (155 DIN-HP) at 2300 RPM at sea level and ISA

7.9.6 COOLING SYSTEM

Each engine is liquid cooled. The liquid cooling system consists of a radiator and a bypass to this radiator. The bypass is in operation when coolant temperatures are low. It therefore allows the engine to warm-up quickly. Upon reaching a certain temperature (approximately 88 °C or 190 °F) the radiator is activated by a thermostat valve. Additionally a coolant to air heat exchanger is provided for the cabin heat system. The flow through the heat exchanger is independent of the coolant temperature. An expansion tank helps to adjust the pressure in the system. The system is protected against overpressure by means of a pressure relief valve.



7.9.6 OIL SYSTEMS

Each engine has two separate oil systems.

Lubrication System (Engine and Turbo-Charger)

The engine lubrication is a wet sump lubrication system. The engine oil is cooled by an integrated oil/coolant heat exchanger which is part of the engine.

A dip-stick is provided to check the oil quantity through an inspection hole in the upper cowling.

Gearbox and Propeller Governor System

The second oil circuit lubricates the gearbox and serves the propeller as well as the propeller regulating system.

The gearbox oil system incorporates an oil/coolant heat exchanger to cool gearbox oil.

The gearbox oil quantity can be checked with the help of an inspection glass which can be reached through an inspection hole on the front side of the lower cowling.

CAUTION

If the gearbox oil quantity is too low, an unscheduled maintenance is necessary (for approved oil grades refer to Section 2.4 - POWER-PLANT LIMITATIONS).

8. AIRPLANE HANDLING, CARE AND MAINTENANCE

No change.

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