Diamond DA40 NG

Dimensions

11,63 m
Dimensions

1,97 m

1,68 m
1,85 with increased MLW

8,01 m

Dimensions

1,90 m

2,97 m
Diamond DA40 NG

Exterior

Antenna locations
ELT and VHF COM 1 Antenna

- ELT antenna in fuselage structure
- VHF COM 1

VHF COM 2 antenna
VHF NAV + GP Antennas

in the horizontal stabilizer

Marker Antenna

Fuselage belly
GPS antennas

Cabin roof

DME, TXPDR, TAS Antenna

DME

Transponder

TAS
ADF antenna

Pitot Probe

Left wing
Static Ports

Both sides of fuselage

Lift Detector (Stall Warning)

Left wing
Landing/Taxi Light

Engine Oil and Gear Oil
Engine Oil and Gear Oil

Engine Oil and Gear Oil
Engine Oil

Gear Oil
Air Inlets

Cabin air heater and Reduction Gear cooling

Intercooler

Coolant heat exchanger
Coolant Radiator Inlet Baffle

Must be installed when OAT at take-off is below -30°C, but operation with baffle only up to 0°C.

Air Inlets

Engine air intake

RH front Ventilation
Air Inlets

LH front Ventilation

May be closed in cold weather with „Ventilation inlet baffle“
With ventilation inlet baffle installed: max OAT for Take-off: 15° C
Diamond DA40 NG

Operating Limitations

Temperature Limitations

- **Airplane temperature:**
  - Below -20°C:
    - Pre-heating required for engine (until oil temp. above -20°C, between -15°C and -10°C recommended) and cockpit
  - Below -30°C:
    - Batteries must be pre-heated
  - Below -40°C:
    - Operation prohibited

- **Outside Air Temperature at TKOF:**
  - Below -30°C:
    - Coolant radiator inlet baffle must be installed
  - Above 0°C:
    - Coolant radiator inlet baffle must be removed
  - Above 15°C:
    - Ventilation inlet baffle must be removed
  - Above 20°C:
    - Fuel cooler inlet baffle must be removed
Altitude Limitation

- Maximum operating altitude: 16,400 ft (5,000 m) Pressure Altitude

Other Limitations

- Aerobatics, spinning, more than 60° bank are prohibited
- Canopy and passenger door must be unlocked during operation
- Max. demonstrated crosswind: 25 kts
Other Limitations

- No Take-off for Night-VFR or IFR with an empty main battery
- No engine start with external power because of an empty main battery if IFR or Night-VFR flight is planned. Battery must be charged first.
- No IFR flight if seal on the Emergency Switch is broken

Intentionally blank
### Diamond DA40 NG

#### Mass

<table>
<thead>
<tr>
<th></th>
<th>Option &quot;574&quot;</th>
<th>Option &quot;662&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty (typical)</td>
<td>900 kg</td>
<td></td>
</tr>
<tr>
<td>Max TKOF</td>
<td>1280 kg</td>
<td>1310 kg</td>
</tr>
<tr>
<td>Max Ramp</td>
<td>+ 4 kg</td>
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<tr>
<td>Max LDG</td>
<td>1216 kg</td>
<td>1280 kg</td>
</tr>
<tr>
<td>Max ZFW</td>
<td>1200 kg</td>
<td>1265 kg</td>
</tr>
<tr>
<td>Min flight</td>
<td>940 kg</td>
<td></td>
</tr>
</tbody>
</table>

Max TKOF: 1280 kg, 1310 kg
Max LDG: 1216 kg, 1280 kg
Max ZFW: 1200 kg, 1265 kg
Min flight: 940 kg
Max Landing Mass

- If the Max Landing Mass is 1216 kg a landing with a mass between 1216 kg and 1280 kg is an „Abnormal Operating Procedure“
- Same as the „Normal Procedure“, observing higher speed: 77 KIAS

Max. Baggage Load

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Baggage Extension</td>
</tr>
<tr>
<td>Standard</td>
<td>30 kg</td>
<td>45 kg</td>
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<tr>
<td>compartment</td>
<td></td>
<td>30 kg</td>
</tr>
<tr>
<td>Max in „tube“</td>
<td>5 kg</td>
<td>---</td>
</tr>
<tr>
<td>(if installed)</td>
<td></td>
<td>---</td>
</tr>
<tr>
<td>Baggage Extension</td>
<td>---</td>
<td>18 kg</td>
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<tr>
<td>Total</td>
<td>35 kg</td>
<td>45 kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45 kg</td>
</tr>
</tbody>
</table>
**Mass**

Option „Baggage Tray + Extended Compartment“

- **Cockpit Baggage Compartment**
  - MAX: 45 kg [100 lb]
  - ARM: 3.89 m [153.1"]

- **Baggage Tray**

- **Baggage Extension**
  - MAX: 18 kg [40 lb]
  - ARM: 4.54 m [178.7”]

**Max. Baggage Total (Cockpit Baggage Compartment & Extension):**
45 kg [100 lb]

**Caution:** Observe weight and balance limitations. See airplane flight manual chapter 6

**„Short“ Baggage Extension**

- **Standard Baggage Compartment**
  - MAX: 30 kg [66 lb]
  - ARM: 3.65 m [143.7 in]

- **Baggage Tray**

- **Short Baggage Extension**
  - MAX: 15 kg [33 lb]
  - ARM: 3.97 m [156.3 in]

**Caution:** Observe weight and balance limitations. See airplane flight manual chapter 6
Attention!
JET fuel and Diesel are heavier than AVGAS!

Typical fuel weight:

<table>
<thead>
<tr>
<th>JET A1:</th>
<th>Diesel:</th>
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</thead>
<tbody>
<tr>
<td>0,8 kg/ltr</td>
<td>0,84 kg/ltr</td>
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<tr>
<td>3,03 kg/USG</td>
<td>3,2 kg/USG</td>
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</table>
Diamond DA40 NG

Speeds

Characteristic Speeds

<table>
<thead>
<tr>
<th>$V_{NO}$</th>
<th>130 KIAS</th>
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<tr>
<td>$V_{NE}$</td>
<td>172 KIAS</td>
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<tr>
<td>$V_{O}$</td>
<td>-1180 kg</td>
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<tr>
<td>101 KIAS</td>
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<tr>
<td>$V_{O}$</td>
<td>1081-1180 kg</td>
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<tr>
<td>$V_{O}$</td>
<td>1181-1280 kg</td>
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</tbody>
</table>
Characteristic Speeds

\[
\begin{align*}
V_{SO} (1310 \text{ kg}) & \quad 60 \text{ KIAS} \\
V_{S1} (1310 \text{ kg}) & \quad 66 \text{ KIAS} \\
V_{FE} (\text{Flaps T/O}) & \quad 110 \text{ KIAS} \\
V_{FE} (\text{Flaps LDG}) & \quad 98 \text{ KIAS}
\end{align*}
\]

Characteristic Speeds

<table>
<thead>
<tr>
<th>KIAS at</th>
<th>940 kg</th>
<th>1000 kg</th>
<th>1100 kg</th>
<th>1200 kg</th>
<th>1280 kg +above</th>
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</thead>
<tbody>
<tr>
<td>(V_R) Flaps T/O</td>
<td>56</td>
<td>58</td>
<td>61</td>
<td>65</td>
<td>67</td>
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<tr>
<td>(V_{50}) up to 50 ft Flaps T/O</td>
<td>62</td>
<td>65</td>
<td>67</td>
<td>70</td>
<td>72</td>
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<tr>
<td>(V_Y) up to safe altitude Flaps T/O</td>
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<td></td>
<td></td>
<td></td>
<td>72</td>
</tr>
<tr>
<td>(V) cruise climb Flaps UP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>88</td>
</tr>
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</table>
### Characteristic Speeds

<table>
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<th>1000 kg</th>
<th>1100 kg</th>
<th>1200 kg</th>
<th>1216 kg</th>
<th>1280 kg + above</th>
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<tbody>
<tr>
<td>$V_{ref}$</td>
<td></td>
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<td>72</td>
<td>76</td>
<td>76</td>
<td>77</td>
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<td>Flaps LDG</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>$V_{ref}$</td>
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</tr>
<tr>
<td>Approach</td>
<td>68</td>
<td>70</td>
<td>74</td>
<td>77</td>
<td>77</td>
<td>78</td>
</tr>
<tr>
<td>Flaps T/O</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>$V_{ref}$</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Approach</td>
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<td>73</td>
<td>78</td>
<td>82</td>
<td>82</td>
<td>83</td>
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<tr>
<td>Flaps UP</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V$ Go Around</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Flaps T/O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Best gliding**

- **Flaps UP, prop windmilling**
  - $V_{ref}$: 88 KIAS
  - 1:9,7
  - 1,59 NM / 1000 ft

Without wheel fairings:
- 1:9,4
- 1,54 NM / 1000 ft
Stalling Speeds

1000 kg

Vso  55  58  
Vs1  60  66  

1310 kg

Vso  56  59  
Vs1  63  68  

Complied by: Peter Schmidleitner
Stalling Speeds

**1000 kg**

- $V_{so}$: 61
- $V_{s1}$: 64

**1310 kg**

- $V_{so}$: 69
- $V_{s1}$: 74

---

Stalling Speeds

**1000 kg**

- $V_{so}$: 72
- $V_{s1}$: 76

**1310 kg**

- $V_{so}$: 82
- $V_{s1}$: 88
Diamond DA40 NG

Flight Controls

Flight Control Operation

Ailerons, Elevator: push rods

Rudder: cables
Flight Control Operation

Flaps: electrically by push rods, left and right mechanically interconnected

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Diamond DA40 NG

Instrument Panel

Garmin 1000
Instrument Panel

- Airspeed
- Horizon
- Altimeter
- Compass

Backup Instruments

Instrument Panel

- Flood Lights
- Emergency Switch
- Emergency Battery (non rechargeable)

IFR flights are not permitted when the seal on the emergency switch is broken.
Instrument Panel

- Lights
- ELT

Instrument Panel

- Circuit breakers
Instrument Panel

Essential Bus

Electric Master Starter

Engine control
Instrument Panel

Avionic Master

Fuel x-fer pump, Pitot heat

Instrument Panel

Flaps
Alternate Static Valve

If Alternate Static is open, Emergency Window and Cockpitvent must be closed.
Diamond DA40 NG

Garmin 1000 EIS
Engine Instrument System

For a detailed description of the G1000 integrated instrument system consult the instruction modules „DA42 G1000, parts 1 to 3“
Garmin 1000

Primary Flight Display (PFD)

Audio Panel

Multi Function Display (MFD)

EIS / Engine Indication System

Multi Function Display

MFD
Engine Indication System

Default page

Display when pushing the SYSTEM softkey

Display when pushing the FUEL softkey

LOAD is not measured, but calculated from common rail fuel pressure, ECU commanded injection time, manifold pressure and Prop RPM.

Fuel Flow is not measured, but calculated from fuel pressure and ECU commanded injection time.

Readouts and labels and pointers appear white to indicate normal operation yellow or red to indicate caution or warning conditions.

Upper part always the same
Engine Indication System

Default
- FLOW GPH 7.0
- OIL TEMP
- OIL PRES
- COOLANT TEMP
- FUEL TEMP
- FUEL QTY GALL

SYSTEM
- ELECTRICAL
  - VOLTS 28.0
  - AMPs 135
- ENGINE
  - GEARBOX C 70
- COOLANT C 75

FUEL
- FLOW GPH 7.0
- GAL 12
- °C 38
- FUEL CALC
  - GAL REM 23.2
  - GAL USED 0.4
  - ENDUR 3:17
  - RANGE NM 432
  - TIL TIME IN SVG 00:23:2 HRS

Engine Indication System with G1000 NXi

Display when pushing the ENGINE button:

- Fluids
  - Oil
  - Electrical
    - Volts
    - Amps
- Engine
  - RPM
  - Fuel
    - Flow GPH
    - Fuel Temp
- Fuel Calculator
  - Gallons Remain
  - % Endurance
  - Range NM
  - CAB Fuel
  - Kerosine
  - Total

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Compiled by Peter Schmidleitner
Diamond DA40 NG

Brake System

Hydraulic brakes

Pilot applies brake
Hydraulic brakes

Copilot applies brake

Parking brake

Apply brake pressure

One-way valve is closed

Pressure is trapped
Parking brake

Intentionally blank
Diamond DA40 NG

Power Plant

Power plant

- 1 Austro Engine E4-A
- Four cylinders, liquid-cooled
  - 1991 ccm
- Common-rail direct injection
- Reduction gear 1:1.69
- Dual digital engine control
- Turbocharger
- Torsion vibration damper isolates engine from propeller
- Max. power: **100%** (5 minutes time limit) 123.5 kW (165.6 DIN-HP) at 2300 RPM
- Max cont. power: **92%** 113.6 kW (152.3 DIN-HP) at 2100 RPM
Alternate air

Alternate air lever

Alternate air valve

Alternate air lever pulled

Alternate air valve open
Use of Alternate Air

**ENGINE TROUBLESHOOTING**

Alternate air............................................. OPEN

**ENGINE RESTART**

Alternate air................................. AS REQUIRED

**UNINTENTIONAL FLIGHT INTO Icing**

Alternate air ...................... OPEN as required

Austro Engine E4-A

Prop governor
ECU – Engine Control Unit

Figure 1: An Engine Control System Schematic Diagram

E.O.T. – Engine Order Telegraph
Engine Control Unit

- ECU „VOTER switch“
- Normally in AUTO position
- Working ECU is automatically selected according operating hours or in case of malfunction

ECU test button

Test on ground (PWR lever idle)
ECU test

**BEFORE TAKE OFF CHECK**

| 11 | Power lever .................................................. IDLE                      |
| 12 | MFD ............................................................... EIS – SYSTEM             |
| 13 | Engine instruments ........................................ CHECKED                 |

Engine temperatures must be in green range before performing ECU test. (For gearbox min.38° recommended). For warm up max power 50%.

| 14 | VOTER switch ......................... A, AUTO, B, AUTO             |

**ECU TEST**

ECU test button................................. press and hold
"ECU A/B fail” ............................................. ON
Prop cycling 2 times to 1800 RPM
"ECU A/B fail” ............................................. OFF
ECU test button................................., release

| 15 | ECU test ........................................ PERFORMED |

---

ECU FAIL Caution

- An ECU FAIL caution is caused by various types of malfunctions. These include internal ECU problems, sensor failure or insufficient performance of air-, fuel- or electrical supply system (e.g. air filter icing).
- Depending on the type of failure, the ECU failure cautions are either
  - ‘non latched’, i.e. the caution message disappears after the cause of the caution is no longer present or
  - ‘latched’, i.e. the caution massage remains until cleared through maintenance action, and Austro Engine has to be informed.
- Clearing of ‘non-latched’ caution:
  - on the active ECU: clears by itself
  - on the passive ECU: by switching to that ECU with the voter switch.
ECU FAIL Caution

**ECU A OR B FAIL**

**ON GROUND**

1. Alternate Air ......................... check CLOSED  
2. Fuel pump .................................OFF  
3. VOTER switch ............................check AUTO  
4. Other ECU caution .........................check OFF

**Clearing procedure:**

5. VOTER switch ......................... set to failed ECU  
   Wait 5 seconds  
6. VOTER switch ............................ AUTO  
   • If ECU caution persists terminate flight preparation

---

**ECU FAIL Caution**

**ECU A OR B FAIL**

**DURING FLIGHT**

Remark: in case of ECU fail the system automatically switches to the other ECU

1. Alternate Air ............................ OPEN  
2. Fuel pump ....................................ON  
3. Circuit breakers .................. CHECK/RESET if necessary  
4. VOTER switch ............................check AUTO  
   • If ECU caution persists:  
     ⇒ Land at nearest suitable airfield  
   • If additional engine problems are observed:  
     ⇒ Go to Emergency Checklist page 4

ENGINE TROUBLESHOOTING

Remark: after landing the clearing procedure for "ECU FAIL ON GROUND" may be used.

**ECU A AND B FAIL**

**DURING FLIGHT**

- Go to Emergency Ckl page 4

ENGINE TROUBLESHOOTING
Engine troubleshooting

If all of the following conditions exist:
- Indicated LOAD unchanged
- Perceived thrust is reduced
- Engine noise level changes or engine running rough

3. POWER lever .................... IDLE for 1 second
4. POWER lever ........ slowly increase to 1975 RPM
   - If engine shows power loss during the
   POWER lever increase
5. POWER lever .................... idle for 1 second
6. POWER lever .................... slowly increase
   stop prior to the RPM where former engine power loss
   was observed

Do not increase the POWER lever past the propeller speed of 1975 RPM or the
setting determined in step 4. An increase of engine power beyond this setting
leads into another power loss.

With this power setting the engine can provide up to 65% at the maximum
propeller speed of 1975 RPM

7. Land at nearest suitable airfield..............

End of Checklist

Power plant

- Power lever selects „LOAD“ in %
- RPM automatically determined by selected power

Recommended Cruise Power Setting: 75%
Propeller

- 3-blade wooden propeller
- Constant speed
- Prop pitch set by ECU via an electro-mechanical actuator on the governor
- Governor operated by gearbox oil
  - Oil pressure up = pitch up = RPM down
  - Oil pressure down = pitch down = RPM up

RPM malfunctions

**OSCILLATING RPM**

1. Power lever ....................... CHANGE SETTING 1
   - If no success:
2. VOTER switch ............... SWAP between A and B 2
   - If no success:
3. VOTER switch ............................. AUTO 3
   Land at nearest suitable airfield

**RPM UNDERSPEED**

1. Power lever ............................. AS REQUIRED 1
2. VOTER switch .................. SWAP between A and B 2
   - If no success:
3. VOTER switch ............................. AUTO 3
4. Power lever ............................. AS REQUIRED 4
   Land at nearest suitable airfield
RPM malfunctions

**RPM OVERSPEED**

1. Power lever .......... ADJUST to max. 2300 RPM
2. Airspeed....................... 88 KIAS
3. Flaps .................................. UP

If RPM stabilized below 2300:
4. Airspeed........................ AS REQUIRED
5. Power lever .................. AS REQUIRED
   but do not exceed 2300 RPM

If RPM still above 2300:
6. VOTER switch .............. SWAP between A and B
   • If no success:
7. VOTER switch ............................ AUTO
   adjust RPM with power lever
   Land at nearest suitable airfield

If increased climb rate required:
8. Flaps .................................... T/O
9. Airspeed....................... 72 KIAS
10. Power lever .......... ADJUST to max. 2300 RPM

Fuel pumps

- 1 engine driven pump
- this high pressure pump feeds the common rail
- (additional electrical fuel pumps are part of the fuel system)
Power plant limitations

- Max overspeed: 2500 RPM, max 20 sec.
- Oil pressure:
  - At idle: min 0,9 bar
  - At max continuous PWR: min 2,5 bar
  - Max: 6,5 bar
  - Normal: 2,5 – 6 bar
- Oil quantity: 5.0 – 7.0 liters
- Max. oil consumption: 0.1 liters/hr
- Oil temperature:
  - Max: -30°C – 140°C
  - Normal: 50°C – 125°C

The yellow cautionary range is for information only. There is no time limit associated with the cautionary temperature range.
Power plant limitations

- Coolant temperature:
  - min -30° C for start up
  - min 60° C full load
  - max 105° C
- Fuel temperature:
  - min -25° C, max 60° C
- Fuel pressure:
  - min 4 bar, max 7 bar
    - no indication on G1000, but warning if below limit

Max. restart altitude:
- 16.400ft PA for immediate restart
- 15.000ft PA for immediate restart with engine software V33_1_05_19 or later
- 10.000ft PA for restart within 2 minutes

After more than 2 minutes cooldown a successful restart may not be possible!

Restart airspeed:
- The propeller will be windmilling
- Airspeed: 88 KIAS
- If propeller has stopped: mechanical engine defect. Do not consider a starter assisted restart!
Power plant limitations

- Intentional negative-g manoeuvres are not permitted

Starter limitations

- Operation: max 10 seconds
- 60 seconds cool down time
Jet Fuel:
- JET A, JET A-1 (ASTM D 1655)
- TS-1 (Russia, GOST 10227-86)
- TS-1 (Ukraine, GSTU 320.00149943.011-99)
- RT (Russia, GOST 10227-86)
- RT (Ukraine GSTU 320.00149943.007-97)
- No. 3 Jet Fuel (China, GB 6537-2006)
- JP-8 (F34) (USA, MIL-DTL-83133G-2010)

Minimum cetane number of 36
(EN ISA 5165/ASTM D613) recommended
- For additives see AFM!

Diesel Fuel
- No additives permitted!

Engine oil:
- e.g. SHELL Helix Ultra
- AEROSHELL Oil Diesel Ultra
- AUSTRO ENGINE Aero

For more oil types see AFM

Gearbox oil:
- Shell Spirax GSX 75W-80
- Shell Spirax S6 GXME 75W-80

Coolant:
- Destilled water + cooler protection
  (BASF Glysantin Protect Plus/G48)
  Mixture 50% / 50%: freezing point -38° C
- For cold weather operation:
  Mixture 40% / 60%: freezing point -53° C
Engine operation

CHECK AFTER ENGINE START
16 Oil and Coolant temperature .................. CHECKED 16
17 Parking brake .................................. RELEASED 17

After engine start max power 50% until
engine temperatures in green range
End of Checklist; see next page for "During taxi" – items

BEFORE TAKE OFF CHECK after line-up
Available power check (see pg.6) ...... PERFORMED

Available Power Check:
10 sec. power MAX, RPM 2200 – 2300 (min. 2100 below -10°C), min. load acc. table below

<table>
<thead>
<tr>
<th>OAT</th>
<th>Altitude (ft)</th>
<th>-35°C</th>
<th>-20°C</th>
<th>-10°C</th>
<th>0°C</th>
<th>10°C</th>
<th>20°C</th>
<th>30°C</th>
<th>40°C</th>
<th>50°C</th>
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<tr>
<td></td>
<td>0</td>
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<td>94%</td>
<td>95%</td>
<td>92%</td>
<td>90%</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

End of Checklist

PARKING CHECK
1 Parking brake .............................................. SET 1
2 Power lever .................................. max 10% for 1 min. 2
3 ELT ............................................. CHECK not activated 3
4 Engine / System page ................................. CHECKED 4
5 Engine / Fuel page ....... TTL TIME IN SVC NOTED 5
6 Avionic master .............................................. OFF 6
7 Electrical consumers except ACL (strobe) ..... OFF 7
8 Engine Master .............................................. OFF 8
9 ACL (strobe) .............................................. OFF 9

When engine indications x-out red:
10 Electric Master .............................................. OFF 10
11 Start key ............................................. REMOVED 11
Power plant warnings

**OIL TEMP**
- Check oil pressure
  - If too low:
    - Reduce power
    - Be prepared for loss of oil and engine fail;
    - be prepared for emergency landing
  - If in green range:
    - Reduce power
    - Increase airspeed

**OIL PRESS**
- Reduce power
- Expect loss of oil
- Land at nearest suitable airfield
- Be prepared for engine fail

**GBOX TEMP**
- Reduce power
- Increase airspeed
  - If gearbox temperature still in red range:
    - Land at nearest suitable airfield
    - Be prepared for engine fail

Power plant abnormals

**OIL pressure high**
- On ground during warm up with low oil temperature
  - Reduce power until oil pressure green,
    continue warm up at reduced power
- During flight
  - Check oil temperature
  - Check coolant temperature
    - If temperatures within green range
      - Oil pressure indication may be faulty;
        watch temperatures
    - If temperatures outside of green range
      - Reduce power;
      - Land at nearest suitable airfield,
        be prepared for engine fail

**Oil pressure low**
- Refer to Emergency Checklist page 6, “OIL PRESS”

**Oil temperature high**
- Refer to Emergency Checklist page 6, “OIL TEMP”

**Oil temperature low**
- Increase power
- Reduce airspeed
Cooling System

Diamond DA40 NG

Cooling system

Pressure Relief Valve
Expansion Tank
Thermostatic Valve
Core Engine
Water Pump
Coolant Heat Exchanger
Cabin Heater
Cooling system

Coolant Temp. < ~80°C

Coolant Temp. > ~80°C
Cooling system

**ENG TEMP**

- Check "COOL LVL" caution message
  - If "COOL LVL" OUT:
    - During climb:
      - Reduce power 10%
      - Increase airspeed 10 KIAS
      - If not returning to green range within 60 seconds:
        reduce power as far as possible and increase airspeed
    - During cruise:
      - Reduce power
      - Increase airspeed, if necessary descend
      - Check coolant temperature in green range
        - If not returning to green range:
          - land at nearest suitable airfield
  - If "COOL LVL" ON:
    - Reduce power
    - Expect loss of coolant fluid
    - Be prepared for emergency landing

---

Cooling system

**Coolant temperature high**

- Refer to Emergency Checklist page 6, "ENG TEMP"

**Coolant temperature low**

- Check "COOL LVL" caution light
  - If ON
    - Reduce power
    - Expect loss of coolant fluid
    - Be prepared for engine failure
Cabin heat

Cabin heat

Cabin Heat
Ventilation

Cockpit

Front ventilation

Ventilation

Cabin

Rear ventilation
Diamond DA40 NG

Turbocharger System

Turbo Charger

Bypass for excess exhaust gas
Turbo Charger

Compressor compresses intake air

Intentionally blank
Diamond DA40 NG

Fuel System

- Standard Tanks
  - Capacity: 2 x 15 USG
  - 2 x 14 USG usable
  - = 28 USG usable
  - = 85 kg
  - At 75% power: ~ 6.5 USG/hr
Fuel System

- Long Range Tanks:
  - Capacity: 2 x 20,5 USG
  - 2 x 19,5 USG usable
  - = 39 USG
  - = 120 kg
  - Max indicated fuel per tank: 14 USG
  - Max. unbalance: 9 USG

Fuel System

Fuel valve
Fuel System

Fuel cooler

Up to 71 USG/hr
Average 45 USG/hr

~60 USG/hr
Fuel System

- The transfer pump is switched OFF automatically when
  - the auxiliary tank is empty
  - the main tank is full (14 USG)

Fuel cooler

- Right wing
- Air inlet
- Air outlet
Fuel System

- Engine
- Fuel Valve
  - Normal
  - Emergency
  - Off
- Fuel Filter
- Fuel Pumps
- Main Tank
- Auxiliary Tank
- Transfer Pump
- Fuel cooler
- Emergency Fuel Supply & Emergency Fuel Transfer
- Emergency Fuel Return & Fuel Transfer
- ~45 USG/hr

Fuel System

"Alternate means for fuel quantity indication"

Position:
- at the bore in the stall strip
Fuel system

- For exact indication the airplane must stand on horizontal ground with wings level
- Therefore:
  - „Fuel indicator II“ is available for pitch angle measurement
  - Place it on top of fuselage in front of vertical tail
  - Read pitch angle and use table to determine exact fuel quantity

Fuel system

Fuel Quantity Indicator II

- Quantity scale
- Level scale
Fuel system

Conversion tables in the AFM
Fuel vents

Fuel tank drain
Fuel gascolator drain

Fuel gascolator drain
Fuel system

- 2 parallel electrical low pressure fuel pumps
- each ECU has an associated fuel pump (ECU A: pump A, ECU B: pump B)
- normal Ops: only one pump working
- when ECU switches over: fuel pumps switch over as well
- When pump fails (low fuel pressure):
  - automatic switch over to other pump by switching to the other ECU
- For TKOF, LDG and with fuel pressure failure:
  - both pumps switched ON manually with FUEL PUMP switch

Fuel pumps
## Fuel pumps

### CHECK BEFORE ENGINE START
- Fuel pumps: OFF 13

### BEFORE TAKE OFF CHECK
- Fuel pumps: ON 18

### CLIMB TO CRUISE CHECK
1. Flaps: CHECKED UP 1
2. Fuel pumps: OFF 2

### DESCENT / APPROACH CHECK
- Fuel pumps: ON 8

### AFTER LANDING CHECK
- Fuel pumps: OFF 3

## Fuel pressure warning

- **Warning annunciation:**
  - FUEL PRESS
Fuel pressure warning

**FUEL PRESS**

- Check fuel quantity
- Check fuel valve NORMAL
- Switch fuel pumps ON
  - If FUEL PRESS warning remains:
    - Fuel valve to EMERGENCY
    - Switch fuel pumps OFF
  - If FUEL PRESS warning still remains
    - Be prepared for engine fail

**FUEL PRESSURE LOW**

Intentionally blank
## DA40NG Diesel Operation

### The following item is added to the Modifications checklist:

<table>
<thead>
<tr>
<th>Modification</th>
<th>Source</th>
<th>Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel Operation</td>
<td>ĆAM 40-370</td>
<td>□ yes □ no</td>
</tr>
</tbody>
</table>

### 9.2 LIST OF SUPPLEMENTS

The following item is added:

<table>
<thead>
<tr>
<th>Sup. No.</th>
<th>Title</th>
<th>Rev. No.</th>
<th>Date</th>
<th>applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>004</td>
<td>Diesel Operation</td>
<td>0</td>
<td>06-Dec-2013</td>
<td>□</td>
</tr>
</tbody>
</table>
DA40NG Diesel Operation

- Fuel Temperature
  - Diesel Operation
    - Minimum: -30° C
    - Maximum: 60° C
  - Modified G1000 Software:

<table>
<thead>
<tr>
<th>Indication</th>
<th>Red arc/bar = lower prohibited range</th>
<th>Yellow arc/bar = caution range</th>
<th>Green arc/bar = normal operating range</th>
<th>Yellow arc/bar = caution range</th>
<th>Red arc/bar = upper prohibited range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel temp.</td>
<td>below -30°C</td>
<td>-30° to +4°C</td>
<td>+5° to 55°C</td>
<td>55° to 60°C</td>
<td>above 60°C</td>
</tr>
</tbody>
</table>

DA40NG Diesel Operation

- Operational Limitations (Fuel Temperature):

<table>
<thead>
<tr>
<th>No engine start below</th>
<th>No take-off below</th>
<th>Diesel Fuel Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5°C (+23°F)</td>
<td>+5°C (+41°F)</td>
<td>Diesel Fuel of unknown class or unknown fuel blend</td>
</tr>
<tr>
<td>-10°C (+14°F)</td>
<td>-5°C (+23°F)</td>
<td>Diesel Fuel Class C</td>
</tr>
<tr>
<td>-15°C (+5°F)</td>
<td>-10°C (+14°F)</td>
<td>Diesel Fuel Class D, E or F</td>
</tr>
</tbody>
</table>
Diesel Fuel Classes (EN 590)

(„Temperate“ climatic zones)

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Class A</td>
</tr>
<tr>
<td>CFPP</td>
<td>°C</td>
<td>+5</td>
</tr>
<tr>
<td>CFPP</td>
<td>°F</td>
<td>+41</td>
</tr>
</tbody>
</table>

CFFP ...... Cold filter plugging point

„Winter Diesel“: Class F

„Arctic“ climatic zones: other classes

If JET Fuel is used, make sure that no Diesel Fuel is remaining in the tanks, neither in the left nor in the right tank.

Otherwise the temperature limitations for Diesel Fuel operation must be observed.

The fuel filter is not heated!
DA40NG Diesel Operation

- If the airplane is operated in a cold environment, it must be changed from Diesel Fuel operation to JET Fuel operation.
- To ensure that no blend of JET Fuel with Diesel Fuel is in one of the tanks, each tank must be refilled at least twice with more than 17.2 US gal (65 l) of JET Fuel. Otherwise both tanks must be drained before refueling with JET Fuel.

**NOTE**

- In order to provide information about the fuel grade it is recommended to enter the fuel grade in the airplane log each time fuel is refilled.

---

**DA40NG Diesel Operation**

**Performance below 10° C OAT**

<table>
<thead>
<tr>
<th>TKOF Ground Roll</th>
<th>Add 6%</th>
</tr>
</thead>
<tbody>
<tr>
<td>TKOF Distance</td>
<td></td>
</tr>
<tr>
<td>TKOF Climb</td>
<td>Reduce by 50 ft/min</td>
</tr>
<tr>
<td>Cruise Climb</td>
<td></td>
</tr>
</tbody>
</table>
Electrical system

General information:
2 types of amperemeter can be installed in aircraft:

The Centre-Zero Ammeter.

The Left-Zero Ammeter.
Electrical system

Observe!
The Amperemeter on the G1000 is a...
Electrical system

Power sources

- Alternator 28V 70A
- ECU Backup Battery 2x14V 7.2Ah
- Main Battery 24V 13.6Ah

Power distribution

- Hot Battery Bus
- Battery Bus 1
- Battery Bus 2
- Main Bus
- Avionic Bus
- Essential Bus
- ENG ECU Bus
Electrical system

External power supply, ELECTRIC MASTER ON

Normal power supply
**Electrical system**

- **Battery Bus 1**
- **Battery Bus 2**
- **Main Bus**
- **Essential Bus**

- **Battery**
  - **Main Battery**
    - **24V 13.6Ah**

- **ECU Bus**
- **ECU backup battery**
  - **24V 7.2 Ah**

- **Avionic Bus**
- **Hot Battery Bus**

**Essential power supply**

**Total electric fail**

- **Alternator**
- **ECU A**
- **ECU B**
- **ECU backup battery**
  - **24V 7.2 Ah**
Hot battery bus

- Accessory power plug
- ELT

Battery bus 1 and 2

- Battery Bus 1
  - starter heavy duty power
- Battery Bus 2
  - ECU BUS
  - Main Bus
    (Electric Master ON, ESS BUS OFF)
  - Essential Bus
    (Electric Master ON, ESS BUS ON)
Main bus

- Essential Bus (ESS BUS OFF)
- Avionic Bus
- Starter control
- MFD
- Fuel x-fer pump
- Avionic-, CDU-cooling fans
- Instrument lights
- Taxi + map lights
- Position lights
- Strobe lights

Essential bus

- PFD
- Horizon
- Air Data Computer
- AHRS
- COM 1
- GPS/NAV 1
- Flood light
- Landing light
- Transponder
- Pitot heat
- Flap system
- Engine instruments
Avionic bus

- COM 2
- GPS/NAV 2
- Audio panel
- Autopilot
- DME
- ADF
- WX 500
- TAS

Essential Bus, Avionic Master
Electric Master
Engine Master

External Power Receptable
External Power Receptable

28 V!
Essential bus switch

The mysterious Essential Bus Switch

Switch location
When is it used?

- When the alternator fails
- to disconnect unnecessary electrical consumers
- to supply battery power to essential electrical consumers

Essential Electrical Power

- Main unserviceable systems
  - Starter control
  - MFD
  - Fuel x-fer pump
  - Avionic-, CDU-cooling fans
  - Instrument lights
  - Taxi + map lights
  - Position lights
  - Strobe lights
  - Avionics Bus
    - COM2, NAV/GPS2, Audio, Autopilot, DME, ADF, WX500, TAS
Diamond DA40 NG

Autopilot GFC700

GFC 700 AFCS

„AFCS“:

- Automatic Flight Control System
  - Flight Director
  - Autopilot
GFC 700 AFCS

- GFC 700 functions:
  - Flight Director (FD)
  - AUTO Pilot (AP)
  - Manual Electric Trim (MET)

Autopilot

- CWS
- AP disconnect
- Manual Electric Trim
Autopilot

GFC 700 AFCS

Aircraft Attitude Symbol
Flight Director Command Bars
GFC 700 AFCS

- **AP ON/OFF**
- **FD ON/OFF**
- **NAV Mode**
- **ALT hold**
- **Vert speed**
- **FL change = IAS hold**
- **HDG select**
- **APCH mode**
- **Vertical NAV**
- **Nose UP for Pitch VS IAS**
- **Nose DN for Pitch VS IAS**

Second push deactivates the mode

---

**FLC ("Flight Level Change" Mode):**

- "FLC" = IAS hold
- A target altitude must be selected first
- FLC does **not initiate** the level change to the selected altitude
- Current altitude is maintained until either engine power or IAS reference are adjusted
- FLC does not allow the aircraft to climb or descend away from the target altitude
**GFC 700 AFCS**

**System Status Annunciation**

![Image of GFC 700 AFCS system status](image)

---

<table>
<thead>
<tr>
<th>Condition</th>
<th>Annunciation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch Failure</td>
<td>[PITCH]</td>
<td>Pitch axis control failure. AP is inoperative.</td>
</tr>
<tr>
<td>Roll Failure</td>
<td>[ROLL]</td>
<td>Roll axis control failure. AP is inoperative.</td>
</tr>
<tr>
<td>AP TRIM Switch Stuck, or Pitch Trim Axis Control Failure</td>
<td>[PTRM]</td>
<td>If annunciates when AP is engaged, a failure has occurred in the pitch trim system. If annunciates when AP is not engaged, a failed or stuck switch is causing the annunciation.</td>
</tr>
<tr>
<td>System Failure</td>
<td>[AFCS]</td>
<td>AP and manual trim (AP TRIM) are unavailable. FD may still be available.</td>
</tr>
<tr>
<td>Elevator Mistrim Up</td>
<td>[TELE]</td>
<td>A condition has developed causing the pitch servo to provide a sustained force in the nose up direction.</td>
</tr>
<tr>
<td>Elevator Mistrim Down</td>
<td>[IELE]</td>
<td>A condition has developed causing the pitch servo to provide a sustained force in the nose down direction.</td>
</tr>
<tr>
<td>Alleron Mistrim Left</td>
<td>[AIL]</td>
<td>A condition has developed causing the rudder servo to provide a sustained left force.</td>
</tr>
<tr>
<td>Alleron Mistrim Right</td>
<td>[ATL]</td>
<td>A condition has developed causing the rudder servo to provide a sustained right force.</td>
</tr>
<tr>
<td>Preflight Test</td>
<td>[PTY]</td>
<td>Performing preflight system test. Upon completion of the test, the aural alert will be heard. Preflight system test has failed.</td>
</tr>
</tbody>
</table>
GFC 700 AFCS

When FD or AP is engaged:

<table>
<thead>
<tr>
<th>Bank Angle</th>
<th>Flight Director Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 6°</td>
<td>Rolls wings level</td>
</tr>
<tr>
<td>6° to 25°</td>
<td>Maintains current aircraft roll attitude</td>
</tr>
<tr>
<td>&gt; 25°</td>
<td>Limits bank to 25°</td>
</tr>
</tbody>
</table>

Flight Mode Annunciators

„AFCS Status Box“
GFC 700 AFCS

Flight Mode Annunciators „AFCS Status Box“

Armed modes: white
Active modes: green

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GFC 700 AFCS

Flight Mode Annunciators
„AFCS Status Box“

**GFS** | **ROL** | **AP** | **VS** | **1000 FPM** | **ALTS** | **VPTH**

- **AP status**
- Automatic disconnect
- Manual disconnect
- Control Wheel Steering

**Vertical mode**
### GFC 700 AFCS

**Vertical modes**

<table>
<thead>
<tr>
<th>Vertical Mode</th>
<th>Control</th>
<th>Annunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch Hold</td>
<td>(default)</td>
<td>PIT</td>
</tr>
<tr>
<td>Selected Altitude Capture</td>
<td>*</td>
<td>ALTS</td>
</tr>
<tr>
<td>Altitude Hold</td>
<td>ALT Key</td>
<td>ALT nnnn ft</td>
</tr>
<tr>
<td>Vertical Speed</td>
<td>VS Key</td>
<td>VS nnn nmi</td>
</tr>
<tr>
<td>Flight Level Change</td>
<td>FLC Key</td>
<td>FLC nnn nmi</td>
</tr>
<tr>
<td>Vertical Path Tracking</td>
<td>VNV Key</td>
<td>VNH</td>
</tr>
<tr>
<td>VNH Target Altitude Capture</td>
<td>**</td>
<td>ALTV</td>
</tr>
<tr>
<td>Glidepath***</td>
<td>APR Key</td>
<td>GP</td>
</tr>
<tr>
<td>Glide</td>
<td>GA Button</td>
<td>GA</td>
</tr>
</tbody>
</table>

**Vertical mode range and change increments**

<table>
<thead>
<tr>
<th>Pitch Mode</th>
<th>Control</th>
<th>Annunciation</th>
<th>Reference Range</th>
<th>Reference Change Increment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch Hold</td>
<td>(default)</td>
<td>RT</td>
<td>-15° to +20°</td>
<td>0.5°</td>
</tr>
<tr>
<td>Altitude Hold</td>
<td>ALT Key</td>
<td>ALT nnnn ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical Speed</td>
<td>VS Key</td>
<td>VS nnn nmi</td>
<td>-3000 to +1500 fpm</td>
<td>100 fpm</td>
</tr>
<tr>
<td>Flight Level Change</td>
<td>FLC Key</td>
<td>FLC nnn nmi</td>
<td>70 to 165 kt</td>
<td>1 kt</td>
</tr>
<tr>
<td>Glideslope Arm/Capture/Track</td>
<td>APR Key</td>
<td>GS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go Around</td>
<td>GA Button</td>
<td>GA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### GFC 700 AFCS

**Flight Mode Annunciators „AFCS Status Box“**

<table>
<thead>
<tr>
<th>Roll Mode</th>
<th>Control</th>
<th>Annunciator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll Hold</td>
<td>(default)</td>
<td>ROL</td>
</tr>
<tr>
<td>Heading Select</td>
<td>HDG Key</td>
<td>HDG</td>
</tr>
<tr>
<td>Navigation, GPS Arm/Capture/Track</td>
<td>NAV Key</td>
<td>GPS</td>
</tr>
<tr>
<td>Navigation, VOR Enroute Arm/Capture/Track</td>
<td>NAV Key</td>
<td>VOR</td>
</tr>
<tr>
<td>Navigation, LOC Arm/Capture/Track (No Glideslope)</td>
<td>NAV Key</td>
<td>LOC</td>
</tr>
<tr>
<td>Navigation, Backcourse Arm/Capture/Track</td>
<td>NAV Key</td>
<td>BC</td>
</tr>
<tr>
<td>Approach, GPS Arm/Capture/Track</td>
<td>APR Key</td>
<td>VAPP</td>
</tr>
<tr>
<td>Approach, VOR Arm/Capture/Track</td>
<td>APR Key</td>
<td>LOC</td>
</tr>
<tr>
<td>Approach, ILS Arm/Capture/Track (Glideslope Mode automatically armed)</td>
<td>APR Key</td>
<td>GA</td>
</tr>
<tr>
<td>Go Around</td>
<td>GA Button</td>
<td>GA</td>
</tr>
</tbody>
</table>
GFC 700 AFCS

GA mode active

- Wings level
- 7° pitch up

What the FD/AP flies

What the pilot wants
GFC 700 AFCS

**Vertical Speed Mode**

- Selected Vertical Speed
- Vertical Speed Bug

GFC 700 AFCS

**IAS Hold Mode**

(„Flight Level Change”)

- Selected Airspeed
- Airspeed Reference Bug
GFC 700 AFCS

Overspeed Protection

LIMITATIONS FOR GFC 700 AUTOPILOT SYSTEM:

DO NOT USE AP IF "ALTERNATE STATIC" IS OPEN.

CONDUCT AP AND TRIM CHECK PRIOR TO EACH FLIGHT (SEE AFM).

AUTOPilot OFF DURING TAKE-OFF AND LANDING.

MAXIMUM SPEED FOR AUTOPILOT OPERATION IS 165 KIAS.
MINIMUM SPEED FOR AUTOPILOT OPERATION IS 70 KIAS.

MINIMUM ALTITUDE FOR AUTOPILOT OPERATION:
CRUISE, CLIMB, DESCENT AND MANEUVERING: 800 FEET AGL
APPROACH: 200 FEET AGL
### G 1000 System Loss Effect upon Autopilot Operation

<table>
<thead>
<tr>
<th>System</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHRS</td>
<td>The Autopilot disconnects, Autopilot and Flight Director are inoperative. Manual electric trim is available.</td>
</tr>
<tr>
<td>HDG function of AHRS</td>
<td>The Autopilot will remain engaged with the loss of the HDG Mode.</td>
</tr>
<tr>
<td>MFD</td>
<td>The Autopilot will remain engaged with limited functionality.</td>
</tr>
<tr>
<td>PFD</td>
<td>The Autopilot disconnects, Autopilot and Flight Director are inoperative. Manual electric trim is available.</td>
</tr>
<tr>
<td>GIA No. 1</td>
<td>The Autopilot disconnects and Autopilot, Flight Director and manual electric trim are inoperative.</td>
</tr>
<tr>
<td>GIA No. 2</td>
<td>The Autopilot disconnects and Autopilot and manual electric trim are inoperative. Flight Director is available.</td>
</tr>
<tr>
<td>GPS No. 1 and 2</td>
<td>The Autopilot and Flight Director operates in NAV modes only (LOC, BC, VOR, VAPP) with reduced accuracy.</td>
</tr>
<tr>
<td>ADC</td>
<td>The Autopilot disconnects and Autopilot is inoperative. The flight director is available except for air data modes (ALT, VS, FLC). Manual electric trim is available.</td>
</tr>
</tbody>
</table>
G 1000 System Loss Effect upon Autopilot Operation

Limited functionality

AP ✓ FD ✓ MET ✓

AP × FD × MET ✓
G 1000 System Loss Effect upon Autopilot Operation

AP ✓ F-DS ✓ MET ✓

ALT VS-FLC

G 1000 System Loss Effect upon Autopilot Operation

AP X F-DS ✓ MET ✓

ALT VS-FLC
G 1000 System Loss Effect upon Autopilot Operation
G 1000 System Loss Effect upon Autopilot Operation

VHF NAV only, reduced accuracy

Intentionally blank
Diamond DA40 NG

Performance

TKOF, LDG Performance general

For temperatures, altitudes and weights between those provided, use a linear interpolation between the neighboring values.
For weights below 1100 kg (2425 lb), use data for the lowest weight.
For operation at outside air temperatures lower than provided in these tables, use data for lowest temperature shown.
Use extreme caution for operation at outside air temperatures higher than provided in the tables (areas are indicated with a diagonal line).

<table>
<thead>
<tr>
<th>Effect of wind</th>
<th>TKOF/LDG distance</th>
<th>TKOF</th>
<th>LDG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headwind</td>
<td>minus 10 % for each</td>
<td>12 kt</td>
<td>20 kt</td>
</tr>
<tr>
<td>Tailwind</td>
<td>plus 10 % for each</td>
<td>2 kt</td>
<td>3 kt</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effect of slope</th>
<th>TKOF</th>
<th>LDG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uphill</td>
<td>For each 1% increase ground roll by</td>
<td>15%</td>
</tr>
<tr>
<td>Downhill</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
X-wind

Max demonstrated crosswind component:

25 kts

Performance Tables

- Fuel Flow
- Stalling Speeds
- TKOF Ground Roll / TKOF Distance
- Climb Performance
  - Take off climb
  - Cruise climb
- Time, Fuel, Distance to Climb
- Cruise Performance
- LDG Ground Roll / LDG Distance
  - Flaps LDG
  - Abnormal Flap Position
- Go-Around Climb Performance
### Fuel Flow

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>2.9</td>
<td>11.0</td>
</tr>
<tr>
<td>35</td>
<td>3.3</td>
<td>12.5</td>
</tr>
<tr>
<td>40</td>
<td>3.7</td>
<td>14.0</td>
</tr>
<tr>
<td>45</td>
<td>4.0</td>
<td>15.5</td>
</tr>
<tr>
<td>50</td>
<td>4.4</td>
<td>16.5</td>
</tr>
<tr>
<td>55</td>
<td>4.7</td>
<td>18.0</td>
</tr>
<tr>
<td>60</td>
<td>5.1</td>
<td>19.5</td>
</tr>
<tr>
<td>65</td>
<td>5.6</td>
<td>21.5</td>
</tr>
<tr>
<td>70</td>
<td>6.1</td>
<td>23.0</td>
</tr>
<tr>
<td><strong>75</strong></td>
<td><strong>6.6</strong></td>
<td><strong>25.0</strong></td>
</tr>
<tr>
<td>80</td>
<td>7.1</td>
<td>27.0</td>
</tr>
<tr>
<td>85</td>
<td>7.6</td>
<td>28.5</td>
</tr>
<tr>
<td>90</td>
<td>8.1</td>
<td>30.5</td>
</tr>
<tr>
<td>95</td>
<td>8.3</td>
<td>31.5</td>
</tr>
<tr>
<td>100</td>
<td>9.4</td>
<td>35.6</td>
</tr>
</tbody>
</table>

6,6 USG/hr

### Stalling Speeds

#### 1000 kg (2205 lb)

<table>
<thead>
<tr>
<th>Flaps</th>
<th>0°</th>
<th>33°</th>
<th>45°</th>
<th>60°</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP</td>
<td>66</td>
<td>65</td>
<td>59</td>
<td>63</td>
</tr>
<tr>
<td>T/O</td>
<td>57</td>
<td>55</td>
<td>54</td>
<td>53</td>
</tr>
<tr>
<td>LDG</td>
<td>52</td>
<td>50</td>
<td>48</td>
<td>47</td>
</tr>
</tbody>
</table>

#### 1100 kg (2465 lb)

<table>
<thead>
<tr>
<th>Flaps</th>
<th>0°</th>
<th>33°</th>
<th>45°</th>
<th>60°</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP</td>
<td>61</td>
<td>59</td>
<td>51</td>
<td>49</td>
</tr>
<tr>
<td>T/O</td>
<td>56</td>
<td>55</td>
<td>50</td>
<td>49</td>
</tr>
<tr>
<td>LDG</td>
<td>57</td>
<td>54</td>
<td>49</td>
<td>48</td>
</tr>
</tbody>
</table>

#### 1200 kg (2645 lb)

<table>
<thead>
<tr>
<th>Flaps</th>
<th>0°</th>
<th>33°</th>
<th>45°</th>
<th>60°</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP</td>
<td>54</td>
<td>51</td>
<td>42</td>
<td>40</td>
</tr>
<tr>
<td>T/O</td>
<td>52</td>
<td>50</td>
<td>42</td>
<td>41</td>
</tr>
<tr>
<td>LDG</td>
<td>50</td>
<td>48</td>
<td>40</td>
<td>39</td>
</tr>
</tbody>
</table>

#### 1310 kg (2888 lb)

<table>
<thead>
<tr>
<th>Flaps</th>
<th>0°</th>
<th>33°</th>
<th>45°</th>
<th>60°</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP</td>
<td>65</td>
<td>63</td>
<td>56</td>
<td>54</td>
</tr>
<tr>
<td>T/O</td>
<td>62</td>
<td>59</td>
<td>55</td>
<td>54</td>
</tr>
<tr>
<td>LDG</td>
<td>60</td>
<td>56</td>
<td>52</td>
<td>51</td>
</tr>
</tbody>
</table>
Take off distance

<table>
<thead>
<tr>
<th>Weight: 1310 kg / 2888 lb</th>
<th>Flaps: T/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁ₐ: 67 KIAS</td>
<td>Power: MAX</td>
</tr>
<tr>
<td>Vᵥₐ: 72 KIAS</td>
<td>Runway: dry, paved, level</td>
</tr>
</tbody>
</table>

Available tables:
- 1310 kg
- 1280 kg
- 1200 kg
- 1100 kg

<table>
<thead>
<tr>
<th>Press. Alt. (ft) / (m)</th>
<th>Distance [m]</th>
<th>Outside Air Temperature - [°C] / [°F]</th>
<th>ISA</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL</td>
<td>365 / 120</td>
<td>385 / 128</td>
<td>400 / 131</td>
</tr>
<tr>
<td>15 m / 50 ft</td>
<td>550 / 180</td>
<td>580 / 190</td>
<td>610 / 198</td>
</tr>
<tr>
<td>305</td>
<td>550 / 180</td>
<td>580 / 190</td>
<td>610 / 198</td>
</tr>
<tr>
<td>15 m / 50 ft</td>
<td>550 / 180</td>
<td>580 / 190</td>
<td>610 / 198</td>
</tr>
<tr>
<td>2000</td>
<td>415 / 137</td>
<td>440 / 144</td>
<td>465 / 151</td>
</tr>
<tr>
<td>610</td>
<td>15 m / 50 ft</td>
<td>415 / 137</td>
<td>440 / 144</td>
</tr>
<tr>
<td>914</td>
<td>15 m / 50 ft</td>
<td>415 / 137</td>
<td>440 / 144</td>
</tr>
</tbody>
</table>

Headwind: TKOF distance minus 10% for each 12 kt
Tailwind: TKOF distance plus 10% for each 2 kt
Uphill slope: Ground roll plus 15% for each 1% of slope
Without wheel fairings: Ground roll plus 20 m TKOF distance plus 30 m

TKOF on Grass RWY

<table>
<thead>
<tr>
<th>Length of grass</th>
<th>TKOF roll</th>
<th>Wet grass</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 cm</td>
<td>+ 10%</td>
<td>additional + 20%</td>
</tr>
<tr>
<td>5 - 10 cm</td>
<td>+ 30%</td>
<td></td>
</tr>
<tr>
<td>10 - 25 cm</td>
<td>+ 45%</td>
<td></td>
</tr>
<tr>
<td>&gt; 25 cm</td>
<td>TKOF should not be attempted</td>
<td>+ 50% on soft ground!</td>
</tr>
</tbody>
</table>
### Climb performance

**Take-Off Climb - Flaps T/O**

<table>
<thead>
<tr>
<th>Weight [kg]</th>
<th>Press. Alt. [ft]</th>
<th>Rate of Climb - [ft/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1310</td>
<td>600</td>
<td>10</td>
</tr>
<tr>
<td>1280</td>
<td>620</td>
<td>20</td>
</tr>
<tr>
<td>1200</td>
<td>630</td>
<td>30</td>
</tr>
<tr>
<td>1100</td>
<td>640</td>
<td>40</td>
</tr>
</tbody>
</table>

**Cruise Climb - Flaps UP**

<table>
<thead>
<tr>
<th>Weight [kg]</th>
<th>Press. Alt. [ft]</th>
<th>Rate of Climb - [ft/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1310</td>
<td>606</td>
<td>10</td>
</tr>
<tr>
<td>1280</td>
<td>620</td>
<td>20</td>
</tr>
<tr>
<td>1200</td>
<td>630</td>
<td>30</td>
</tr>
<tr>
<td>1100</td>
<td>640</td>
<td>40</td>
</tr>
</tbody>
</table>
Climb performance

- Climb Performance
  - Tables show rate of climb
    - Conversion to gradient:
      \[ \text{Gradient [%]} = \frac{\text{ROC [fpm]}}{\text{TAS [ktas]}} \times 0.98 \]
    - with TAS: „still air gradient“!

- For operation without wheel fairings a climb rate decreased by 40 ft/min must be expected

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SL</td>
<td>15</td>
<td>59</td>
<td>67</td>
<td>850</td>
<td>645</td>
<td>3.3</td>
<td>3</td>
<td>0.0</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>2000</td>
<td>650</td>
<td>11</td>
<td>52</td>
<td>889</td>
<td>645</td>
<td>3.3</td>
<td>3</td>
<td>0.4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4000</td>
<td>1219</td>
<td>7</td>
<td>45</td>
<td>50</td>
<td>645</td>
<td>3.3</td>
<td>6</td>
<td>0.9</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>6000</td>
<td>1829</td>
<td>3</td>
<td>38</td>
<td>91</td>
<td>640</td>
<td>3.2</td>
<td>9</td>
<td>1.3</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>8000</td>
<td>2438</td>
<td>-1</td>
<td>30</td>
<td>122</td>
<td>630</td>
<td>3.2</td>
<td>13</td>
<td>1.8</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>10000</td>
<td>3048</td>
<td>-5</td>
<td>23</td>
<td>154</td>
<td>625</td>
<td>3.2</td>
<td>16</td>
<td>2.2</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>12000</td>
<td>3658</td>
<td>-9</td>
<td>16</td>
<td>155</td>
<td>620</td>
<td>3.2</td>
<td>19</td>
<td>2.7</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>14000</td>
<td>4267</td>
<td>-13</td>
<td>9</td>
<td>57</td>
<td>615</td>
<td>3.1</td>
<td>23</td>
<td>3.1</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>16000</td>
<td>4877</td>
<td>-17</td>
<td>2</td>
<td>18</td>
<td>605</td>
<td>3.1</td>
<td>26</td>
<td>3.7</td>
<td>43</td>
<td></td>
</tr>
</tbody>
</table>

Available tables:
- Flaps UP
  - 1310 kg
  - 1280 kg
  - 1200 kg
  - 1100 kg
Time, Fuel, Dist to Climb

- Time, Fuel, Distance to Climb:
  - Based on ISA, zero wind
  - Add 5% to time and fuel, 10% to distance for each 10° increase of OAT

- Method of calculation:
  1. get values for airfield altitude
  2. get values for for cruise altitude
  Result: subtract 1 from 2

---

**True Air Speed**

**Cruise Performance**

<table>
<thead>
<tr>
<th>Press. Alt. [m] / [ft]</th>
<th>ISA-10</th>
<th>ISA</th>
<th>ISA+10</th>
<th>ISA+20</th>
<th>ISA+20</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>92</td>
<td>83</td>
<td>137</td>
<td>92</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>66</td>
<td>108</td>
<td>75</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>51</td>
<td>91</td>
<td>60</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>23</td>
<td>74</td>
<td>54</td>
<td>23</td>
</tr>
<tr>
<td>4000</td>
<td>92</td>
<td>83</td>
<td>137</td>
<td>92</td>
<td>83</td>
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<tr>
<td></td>
<td>75</td>
<td>66</td>
<td>108</td>
<td>75</td>
<td>66</td>
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<td></td>
<td>60</td>
<td>51</td>
<td>91</td>
<td>60</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>23</td>
<td>74</td>
<td>54</td>
<td>23</td>
</tr>
<tr>
<td>6000</td>
<td>92</td>
<td>83</td>
<td>137</td>
<td>92</td>
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<td></td>
<td>75</td>
<td>66</td>
<td>108</td>
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<td></td>
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<td>51</td>
<td>91</td>
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<td>51</td>
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<tr>
<td></td>
<td>54</td>
<td>23</td>
<td>74</td>
<td>54</td>
<td>23</td>
</tr>
</tbody>
</table>

Only one table for 1310kg

Up to 16000 ft
## Landing distance

### Landing Distance - Flaps LDG - 1310 kg / 2888 lb

<table>
<thead>
<tr>
<th>Press. Alt. (m)</th>
<th>Distance (m)</th>
<th>Outside Air Temperature - [°C] / [°F]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 / 32</td>
<td>10 / 50</td>
</tr>
<tr>
<td></td>
<td>20 / 68</td>
<td>30 / 88</td>
</tr>
<tr>
<td></td>
<td>40 / 104</td>
<td>50 / 122</td>
</tr>
<tr>
<td></td>
<td>ISA</td>
<td></td>
</tr>
<tr>
<td>SL</td>
<td>Ground Roll</td>
<td></td>
</tr>
<tr>
<td>0100</td>
<td>15 m / 50 ft</td>
<td>620 650 670 680 720 760 650</td>
</tr>
<tr>
<td>305</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>014</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Headwind:</td>
<td>LDG distance minus 10% for each 20 kt</td>
</tr>
<tr>
<td></td>
<td>Tailwind:</td>
<td>LDG distance plus 10% for each 3 kt</td>
</tr>
<tr>
<td></td>
<td>Downhill slope: Ground roll plus 10% for each 1% of slope</td>
<td></td>
</tr>
</tbody>
</table>

### Available tables:
- Flaps LDG
  - 1310 kg
  - 1280 kg
  - 1200 kg
  - 1100 kg
- Flaps T/O or UP
  - 1310 kg
  - 1280 kg
  - 1200 kg
  - 1100 kg

## LDG on wet or Grass RWY

<table>
<thead>
<tr>
<th>LDG roll</th>
<th>Paved RWY WET</th>
<th>Length of grass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet grass or soft ground</td>
<td>+ 15%</td>
<td>additional + 15%</td>
</tr>
<tr>
<td>- 5 cm</td>
<td>+ 30%</td>
<td></td>
</tr>
<tr>
<td>&gt; 5 cm</td>
<td>min + 45%</td>
<td></td>
</tr>
</tbody>
</table>

### Notes:
- Headwind: LDG distance minus 10% for each 20 kt
- Tailwind: LDG distance plus 10% for each 3 kt
- Downhill slope: Ground roll plus 10% for each 1% of slope

---

Compiled by Peter Schmidleitner
Go around

**Go-Around Climb Performance**

<table>
<thead>
<tr>
<th>Flaps: LDG</th>
<th>Power: MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{APP}</td>
<td></td>
</tr>
<tr>
<td>77 KIAS at 1280 kg (2822 lb) and 1310 kg (2888 lb)</td>
<td></td>
</tr>
<tr>
<td>76 KIAS at 1200 kg (2645 lb)</td>
<td></td>
</tr>
<tr>
<td>72 KIAS at 1100 kg (2425 lb)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight, kg [lb]</th>
<th>Press. Alt. [ft]</th>
<th>Rate of Climb - [ft/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Press. Alt. [m]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outside Air Temperature - [°C] / [°F]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-20</td>
</tr>
<tr>
<td>-4</td>
<td>14</td>
<td>32</td>
</tr>
<tr>
<td>1200, 2000</td>
<td></td>
<td>410</td>
</tr>
<tr>
<td>2000</td>
<td>810</td>
<td>365</td>
</tr>
<tr>
<td>4000</td>
<td>1210</td>
<td>360</td>
</tr>
<tr>
<td>6000</td>
<td>1820</td>
<td>360</td>
</tr>
<tr>
<td>8000</td>
<td>2438</td>
<td>350</td>
</tr>
<tr>
<td>10000</td>
<td>3049</td>
<td>330</td>
</tr>
</tbody>
</table>

**Available tables:**
- Flaps LDG
  - 1310 kg
  - 1280 kg
  - 1200 kg
  - 1100 kg

Glide

**Best gliding**
- Flaps UP, prop windmilling
- 88 KIAS

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Distance / 1000 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:9,7</td>
<td>1,59</td>
</tr>
</tbody>
</table>

**Without wheel fairings:**

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Distance / 1000 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:9,4</td>
<td>1,54</td>
</tr>
</tbody>
</table>
Obstacles

\[ \text{Gradient} = \left( \frac{\text{"h"}}{\text{"d"}} \right) \] * 100

\[ \text{ROC} = \frac{\text{Gradient} \times \text{TAS}}{0.98} \]

Vöslau RWY 31

\[ \text{\"d\"} = (950 + 830) - 600 = 1180 \]

Gradient = (30 / 1180) * 100 = 2.54 %

\sim 200 \text{ fpm} \]

At 1280 kg: \sim 380 \text{ fpm}
Empty Mass

- Empty Mass includes:
  - Equipment as per Equipment Inventory
  - Brake fluid
  - Coolant fluid
  - Gear oil
  - Engine oil
  - Unusable fuel (2 x 1,0 USG)
**Center of Gravity Envelope**

![Graph showing center of gravity envelope for a Diamond DA40 NG aircraft. The graph includes a shaded area indicating the weight and corresponding center of gravity positions.](image)

**Moment Arms**

<table>
<thead>
<tr>
<th>Item</th>
<th>Lever Arm (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front seats</td>
<td>2.30</td>
</tr>
<tr>
<td>Rear seats</td>
<td>3.25</td>
</tr>
<tr>
<td>Wing tanks</td>
<td>2.63</td>
</tr>
<tr>
<td>Standard baggage</td>
<td>3.65</td>
</tr>
<tr>
<td>Baggage tube</td>
<td>4.32</td>
</tr>
<tr>
<td>Short bagage extension</td>
<td>3.97</td>
</tr>
<tr>
<td>Extended baggage</td>
<td></td>
</tr>
<tr>
<td>FWD</td>
<td>3.89</td>
</tr>
<tr>
<td>AFT</td>
<td>4.54</td>
</tr>
</tbody>
</table>
Baggage Compartments

Option „Baggage Tray + Extended Compartment“

MAX. BAGGAGE TOTAL (COCKPIT BAGGAGE COMPARTMENT & EXTENSION): 45 kg [100 lb]
CAUTION: OBSERVE WEIGHT AND BALANCE LIMITATIONS
SEE AIRPLANE FLIGHT MANUAL CHAPTER 6

Baggage Compartments

Option „Short Baggage Extension“

CAUTION: OBSERVE WEIGHT AND BALANCE LIMITATIONS
SEE AIRPLANE FLIGHT MANUAL CHAPTER 6
### M&B Calculation

<table>
<thead>
<tr>
<th>Lever arm</th>
<th>Mass (kg)</th>
<th>Moment (kgm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty mass</td>
<td>2.42</td>
<td>900</td>
</tr>
<tr>
<td>170 x 2.30 = 391.0</td>
<td></td>
<td>391.0</td>
</tr>
<tr>
<td>Front seats</td>
<td>2.30</td>
<td>170</td>
</tr>
<tr>
<td>80 x 3.25 = 260.0</td>
<td></td>
<td>260.0</td>
</tr>
<tr>
<td>Rear seats</td>
<td>3.25</td>
<td>80</td>
</tr>
<tr>
<td>Fwd baggage</td>
<td>3.89</td>
<td>10</td>
</tr>
<tr>
<td>Aft baggage</td>
<td>4.54</td>
<td></td>
</tr>
<tr>
<td>Zero Fuel Mass</td>
<td>1160</td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>2.63</td>
<td>60</td>
</tr>
<tr>
<td>Total TKOF Mass</td>
<td>1220</td>
<td></td>
</tr>
</tbody>
</table>

### M&B Calculation

<table>
<thead>
<tr>
<th>Lever arm</th>
<th>Mass (kg)</th>
<th>Moment (kgm)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>900</td>
</tr>
<tr>
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<td>2.30</td>
<td>170</td>
</tr>
<tr>
<td>Rear seats</td>
<td>3.25</td>
<td>80</td>
</tr>
<tr>
<td>Fwd baggage</td>
<td>3.89</td>
<td>10</td>
</tr>
<tr>
<td>Aft baggage</td>
<td>4.54</td>
<td></td>
</tr>
<tr>
<td>Zero Fuel Mass</td>
<td>2.47</td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>2.63</td>
<td>60</td>
</tr>
<tr>
<td>Total TKOF Mass</td>
<td>2.48</td>
<td></td>
</tr>
</tbody>
</table>
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Diamond DA40 NG

Emergency Equipment

Emergency equipment

[Images of emergency equipment and fire extinguisher in an airplane]

© Diamond Flight Training
Compiled by Peter Schmidleitner
Emergency Exit

1. Open the door.
2. Exit the aircraft.

FWD
Egress Hammer
### Kinds of Operation Equipment List (KOEL)

<table>
<thead>
<tr>
<th>For daytime VFR flights</th>
<th>In addition for night VFR flights</th>
<th>In addition for IFR flights</th>
</tr>
</thead>
</table>
| Flight & navigation instruments | • Airspeed indicator  
• Altimeter  
• Magnetic compass  
• 1 headset, used by pilot in command | • Vertical speed indicator (VSI)  
• Attitude gyro  
• Turn & bank indicator  
• Directional gyro  
• VHF radio (COM)  
• VOR receiver  
• Transponder (XPDR)  
• GPS receiver (part of G1000, if installed)  
• Second headset (if PM 1000 intercom is installed) | • Second airspeed indicator (on PFD and backup, if G1000 is installed)  
• Second altimeter  
• Second attitude gyro (on PFD and backup, if G1000 is installed)  
• Second VHF radio (COM)  
• VOR-LOC-GP receiver  
• Second GPS receiver (part of G1000, if installed) |
# Kinds of Operation Equipment List

## KOEL

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>For daytime VFR flights</th>
<th>In addition for night VFR flights</th>
<th>In addition for IFR flights</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engine instruments</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fuel qty.</td>
<td></td>
<td>• Ammeter</td>
<td></td>
</tr>
<tr>
<td>• Oil press</td>
<td></td>
<td>• Voltmeter</td>
<td></td>
</tr>
<tr>
<td>• Oil temp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Coolant temp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Coolant level indicator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Gearbox temp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Load</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Prop. RPM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fuel temp., left &amp; right tank</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fuel flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fuel pressure warning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ECU A/B Caution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Position lights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Strobe lights (anti collision lights)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Landing light</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Instrument lighting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Flood light</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Flashlight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other operational minimum equipment</strong></td>
<td></td>
<td></td>
<td>• Emergency battery (for backup attitude gyro and flood light)</td>
</tr>
<tr>
<td>• Stall warning system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Alternate means for fuel quantity indication (see Section 7.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Safety belts for each occupied seat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Airplane Flight Manual</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Kinds of Operation Equipment List
KOEL

Additional minimum equipment for the intended operation may be required by national operating rules and also depends on the route to be flown.

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Diamond DA40 NG

Servicing

Scheduled maintenance

- Every
  - 100 hours
  - 200 hours
  - 1000 hours
- Annually
Unscheduled maintenance

- Hard landings
- Propeller strike
- Engine fire
- Lightning strike
- Occurrence of other malfunctions and damage

Refuelling
De-icing

- Approved de-icing fluids:
  - Kilfrost TKS 80
  - Aeroshell Compound 07
  - Any AL-5 (DTD 406B)

- Procedure:
  - Remove snow with brush
  - Spray de-icing fluid
  - Wipe dry

Parking

- Short term parking:
  - Parking brake ON, Flaps UP

- Extended or unattended parking, unpredictable wind:
  - Mooring or placing in hangar

- Outside parking at OAT below -38° C:
  - Water / Coolant mixture ratio 40% to 60%

- If battery heating system installed:
  - Recommended to be used if OAT below 0° C
Control surfaces gust lock

Mooring
Complied by: Peter Schmidleitner

Mooring

Tow bar
Diamond DA40 NG

Airconditioning

RACC:

Recirculating Air – Cabin Cooling
Installation

Behind the baggage compartment, therefore only „Short“ baggage compartment

- STANDARD BAGGAGE COMPARTMENT
  - MAX 30 kg [66 lb]
  - ARM: 3,65 m [143,7 in]

- SHORT BAGGAGE EXTENSION
  - MAX 15 kg [33 lb]
  - ARM: 3,97 m [156,3 in]

CAUTION: OBSERVE WEIGHT AND BALANCE LIMITATIONS
SEE AIRPLANE FLIGHT MANUAL CHAPTER 6

RACC Elements

- AUX Power switch + Control panel
  - on center console

- Central unit
  - aft of baggage compartment

- Additional alternator
  - engine compartment, belt driven from propeller shaft
  - Not connected to the electrical system!
RACC Controls

Addititional Alternator
Addititional Alternator

RACC Concept

- Cabin air is circulated through the RACC and thereby cooled
- Cabin air and outside air is also needed for the operation of the RACC
Cooled air outlets

RACC Limitations

- AUX POWER switch and RACC must be OFF in all Emergencies
  - during Take-off, Landing, Go-Around
    - RACC may be ON with modification 40-394, but for flight masses above 1280 kg only when wheel fairings are installed
  - during Abnormal Operating Procedures
  - at OAT below 10° C (50° F)
  - above 10,000 ft MSL
  - when ADF system is used for navigation
    - RACC affects accuracy of the ADF system and the WX 500 Stormscope
- Minimum flight mass: 988 kg
RACC Operation

- On ground with External Power:
  - AUX POWER: check OFF
  - ELECTRIC MASTER: check OFF
  - ENGINE MASTER: check OFF
  - Connect external power
  - RACC: ON

- On ground with engine running:
  - Keep RPM above 800
  - AUX POWER: ON
  - RACC: ON

- Power Off:
  - RACC: OFF (press button for 1 sec)
  - AUX POWER: OFF

RACC Operation

In flight:

- switching RACC System ON:
  - AUX POWER: ON
  - RACC: ON

- switching RACC System OFF:
  - RACC: OFF
  - AUX POWER: OFF
## Take-off

<table>
<thead>
<tr>
<th>Press, Ait. (m)</th>
<th>Distance [m]</th>
<th>Outside Air Temperature [°C]</th>
<th>[°F]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 / 32</td>
<td>10 / 50</td>
<td>20 / 68</td>
<td>30 / 86</td>
</tr>
<tr>
<td>40 / 154</td>
<td>59 / 122</td>
<td>ISA</td>
<td></td>
</tr>
</tbody>
</table>

RACC ON:
- Ground roll increased by 30 m
- TKOF distance increased by 40 m

## Climb and Cruise

Cruise Performance

<table>
<thead>
<tr>
<th>Press, Ait. (m)</th>
<th>ISA-10</th>
<th>ISA</th>
<th>ISA+10</th>
<th>ISA+20</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISA-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISA+10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISA+20</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

RACC ON:
- Reduced by 25 ft/min
- Reduced by 4%
Moment Arms

<table>
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<th>Item</th>
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</tr>
<tr>
<td>Short baggage extension</td>
<td>3.97</td>
</tr>
</tbody>
</table>

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**Diamond DA40 NG**

**Flight Procedures**

**TKOF Profile**

(Fuel pumps are switched OFF)

- Climb to cruise altitude
- 88 KIAS
- Flaps UP
- Climb Power: 60%
- Rotate: 56-67 KIAS

- VSO up to 50 ft: 62-72 KIAS
- Safe altitude
- ~ 110 KIAS
- Circuit altitude
- 88 KIAS
- 50 ft
LDG Profile

(Fuel pumps are switched ON)

Descent/Approach Check

Go Around

Power MAX Flaps T/O

Continue with TKOF profile

< 110 KIAS

Circuit altitude

80 KIAS

66-77 KIAS

66-77 KIAS

72 KIAS

Downwind, latest Base leg

Flaps T/O

Flaps LDG

Checklists

The checklists are not part of the AFM, and they are not „officially Diamond factory-endorsed“.

They are published and used by „Diamond Flight Training“ and are a also a recommendation for an „Operator Checklist“.